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AUTOMOTIVE INDUSTRIES MAUTOMOBILE

Vol. XLVIII

NEW YORK-THURSDAY, FEBRUARY 1, 1923

No. 5

Merchandising Is Dominant Note at Chicago Show

Buying demand brisk, but competition is keen. New car sales assured in quantity. Used car problem worries manufacturers. Ambassador, Climber, Lexington, Pilot, Dort and McFarlan present new models. Princeton and Tarkington shown in special exhibits.

By James Dalton

CHICAGO, Jan. 29.

MERCHANDISING is the dominant note in the annual Chicago Automobile Show, just as it was at New York. The determination to sell cars has pervaded the entire industry from factory presidents down to retail salesmen.

There is no lack of demand on the part of the public and the need for merchandising is not born of a necessity for employing extraordinary efforts to sell this form of transportation. It comes from the realization that companies which are going to live must get a reasonable share of business this year.

The companies now in the field can be divided into three classes. In the first are grouped the large production plants which have no fear whatever of the future, but which are keen rivals for business. In the second class are comparatively small companies, strong financially, which also are close competitors, but all of which are hopeful that they will forge ahead in the race and perhaps overtake some of those in the first class.

In the third category are the small companies which are not particularly strong financially but will make a desperate effort to assure future success by improved salesmanship in the next few months.

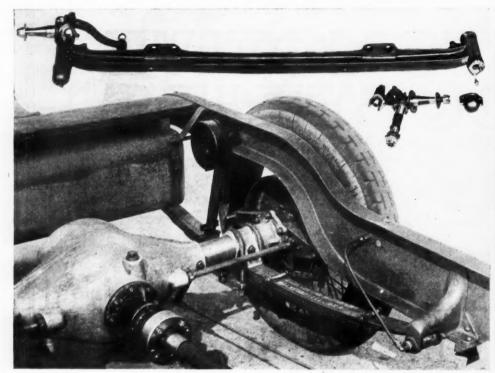
Strangely enough, while competition will be keener

this year than it ever has been before, some manufacturers are a bit perturbed over the demand for new cars which has reached extraordinary proportions for so early a date.

The usual winter selling slump has been conspicuous for its absence this season. Dealers in the more popular lines have full order books, and the companies they represent have been unable to pile up anything like an adequate surplus of finished products for spring delivery. A few factories are having difficulty in keeping abreast of orders, which is an unprecedented condition for January.

The New York show demonstrated that easterners were eager for cars. Then came the shows at Cleveland, Detroit and Oakland, Cal., which showed that middle westerners and the people of the Pacific Coast were equally interested. If added evidence of this general demand were needed, it has been given by the Chicago show.

Attendance on the opening day was even larger than it was in New York and the weather was worse. The crowds which trudged in a drizzling rain through the filthy alley which connects the Coliseum with the armory, where the overflow of cars is displayed, proved that their interest in motor cars was something more than academic.





Front and rear axles used in the Tarkington chassis. Note type of knuckle and tie-rod connections employed. Center and end castings of rear axle are of aluminum.

Probably no other Chicago show ever brought as many dealers to the city. They have come from all over the Middle West and from all the States west of the Mississippi. They haven't come for fun, except incidentally. These dealers are much more concerned about their future than are the manufacturers. Strangely enough, they are not dancing with joy because of the extraordinary interest in new cars. They know that most of the sales they make this year will be based on trades, and they are afraid that every trade will mean a loss.

The used car problem is the black shadow which hangs over the Chicago show and the entire industry. It seems that almost everyone wants a new car, even though the one they now drive isn't in very bad condition. They won't buy new ones unless they get rid of the old. Therefore, they will trade and they will find some dealer who will pay more than he can afford for what they have to sell. In the old days, when first buyers were in the majority, the dealer was eager to make every possible sale, but now first buyers are in the minority, and when the dealer thinks of trades he shudders. He knows what has happened to so many of his neighbors, and he is fearful lest the same bogey will get him this year.

Manufacturers have begun to realize that they cannot afford to fold their hands complacently and aver that the used car is a dealer problem. A few of them admit frankly that it isn't, and all of them know in their hearts that it isn't, although they may refuse to admit it. They know that if the used car market is glutted in the next few months it will check sharply the sale of new products and that it will wreck many of their dealers.

This is the reason why there is concern over the insistent demand for new cars. It may lead to earnest, constructive efforts in the next few months on the part of manufacturers to help take the evil out of trading, and, if it does, it will have been worth while.

Sales for the first quarter of 1923 unquestionably will reach a higher total than ever before. Reports brought from every section of the country by dealers who already have arrived make this much certain. These dealers know they will have a big turnover, but what they are fearful about is profits. Those which have not learned to extract substantial earnings from service and the sale of accessories are likely to have trouble making both ends meet unless they can find some means of selling new cars without ruinous trading. For that reason the Boston plan or some other cooperative measure is likely to be adopted much more generally than in the past.

In addition to helping wipe out the trading evil by the elimination of special discounts and in other ways, there is much which manufacturers can do to teach their dealers that they can make money out of service and accessories. This is a work in which the entire industry can join with mutual profit. It must be done sooner or later and the sooner the better.

Sales Managers Busy

Factory sales managers are just as busy here as they were in New York, and there will be just as large a turnover of dealers from one company to another. Every factory asserts that it is making large additions to its sales organization. A good many say they have doubled the size of their forces in the last few months. The chances are that some of these claims should be discounted, for they give rise to the natural query, "Where are all these dealers coming from?" There aren't enough to meet the demand. It is probable that thousands of those on factory lists haven't made a sale in months.

It is certain, however, that competition for dealers is as fierce as the competition for sales. It is equally certain that dealers are much more independent than they once were. They know that they will have no difficulty in getting a contract from some factory which is a rival of the one they serve. A large number which have held exclusive agencies for low-priced cars are taking on, in addition, some higher priced line to meet the demand of old customers who are moving up in the motor car social scale.

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While there is no doubt about the volume of business in prospect, there are many factors of uncertainty confronting the industry. In the first place, 1923 will be the first normal year in half a decade or more, and no one knows exactly what a normal year will mean in the number of new car sales and in the way of replacements. It begins to look as though old theories in regard to the life of a car might have to go into the discard. Lower prices have made it evident that no owner with a substantial income is going to drive the same car for five or six years unless it is in the very highest price class. This means a constant shifting of ownership, for no car which will run is now being thrown away.

Then, too, normal conditions mean a period of stabilization of business methods. In the case of the automotive industry this means merchandising methods.

With a more general conception of these common problems, the national shows have become conventions of the industry at which factory executives and dealers exchange ideas on subjects of mutual interest. From the viewpoints of the dealers in New York and Chicago they promote sales, but for the industry as a whole they have a deeper and more important meaning.

There is a good deal of discussion here of the contention of Norval A. Hawkins that shows are not worth while from the manufacturer's point of view. While there is sympathy with some of his ideas on the subject, the general opinion is that there must be each year at least two such gatherings of dealers and factory representatives. Until some better machinery can be built, there is no likelihood that the present system will be materially changed.

Show week in Chicago promises to be a great business building convention of the industry. Virtually all the dealer meetings which brought manufacturers and eastern dealers together in New York are to be repeated, and it looks as though the trade attendance in the western show capital will be somewhat larger than in the eastern. In Chicago they don't have the barrier of the Atlantic Ocean, and, without heavy carfare expenses, dealers can come from four directions instead of three, as at New York. They began coming on the opening day, and some luckless individuals who tried to get hotel rooms without advance arrangements voiced the opinion that half the United States must be headed for the lakeside metropolis.

The show itself was as bright as the Chicago show always is-perhaps a little brighter. Using light colors, a skillful decorator hid the grimy gloominess of the Coli-

seum interior and provided an effective exposition setting for the cars and automotive equipment on display. The decorator did more than many of the exhibitors to give the people something to talk about. All the stripped and cutout chassis that were at New York-a fine array and an educational one-were on display, but there were not quite so many special bodies and special paint jobs, and of those that were shown several offended rather than attracted. There must have been at least half a dozen artistic headaches in full action when some of the show jobs were painted.

The show was not remarkable for the new products shown. Three cars not displayed at New York were in evidence. The Yellow Cab Mfg. Co. exhibited the Ambassador and explained that this car was being made up to order. Only closed jobs were being offered.

The Climber, the Little Rock car, was back in the show and the exhibit was featured by a roadster. The Lexington had a new model roadster, called the Skylark. Otherwise the cars shown were very much the same as at New York.

No Startling Price Changes

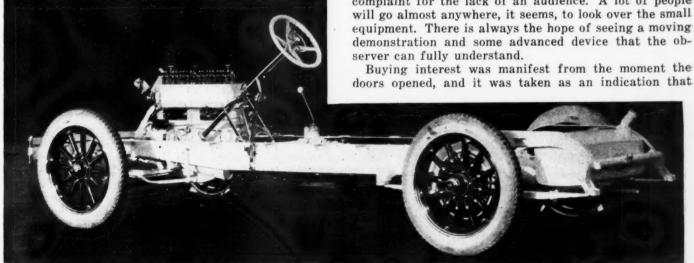
Price changes were not startling. A few dollars up and down on particular models practically took care of these adjustments. There was nothing in this line to disturb the calm of the manufacturers as a whole. In this respect the show was much different from last year.

The interest of the public was manifest in the usual way. As the choice of spaces are given in order of total business at factory price, the heavy production cars are grouped on the main floor of the Coliseum, the next in production interest in the annex and the lower production in the armory. It naturally follows that the main crowd is in the main floor of the Coliseum. Here, too, are the best mechanical exhibits. The stripped chassis, all of them more or less cutout to show the action of the parts, the engines with sections of walls replaced with glass to show air passage or lubrication, and the other educational devices are featured most heavily in this section.

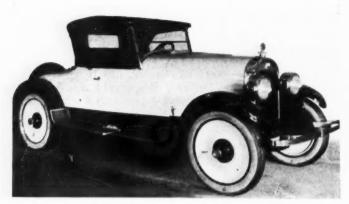
Also it is demonstrated here that there is much more interest in the changes of a well-known model than in a little known one. Over in the armory the cars are more individual in design, with more approach to freakishness and more brilliant color, but not all the crowd reaches this part of the show.

There are more accessory and equipment booths than in New York, and while they are scattered in balconies, a second floor and a basement, the exhibitors have no complaint for the lack of an audience. A lot of people will go almost anywhere, it seems, to look over the small equipment. There is always the hope of seeing a moving demonstration and some advanced device that the observer can fully understand.

Buying interest was manifest from the moment the



The new Princeton chassis. Note depth of frame and heavy tubular member at the rear



Lexington brings out new Skylark model

this was to be a great buying show. The Chicago dealers who were supplying the salesmen for the exhibits were quite enthusiastic over the prospects. Several of the dealers who thought they had adequately manned their exhibits were compelled to send for more salesmen before the show was two hours old.

There were some first-time buyers and some prospects who didn't own cars among the early comers, which will soft-pedal somewhat assertions that there is no longer any such thing as a "clean" sale, but there can be no denying the truth that the average dealer this year must sell anywhere from 75 to 125 used cars for every 100 new cars he delivers.

Pilot

One of the rather unusual mechanical constructions noted is the method used by Pilot in supporting the rear end of the rear springs from the frame and mounting the bumper. Instead of using the usual shackles at this point, the company hangs the spring from the frame by two C springs which are made up in laminated form, very much after the same pattern of the conventional semi-elliptic springs, with the exception, of course, that they are bent into almost a complete circle. The bumper is mounted directly on the thickest part of these springs.

Incidentally, this car is an excellent example of accessibility when it comes to the gasoline tank filler neck. The neck is brought to the outside of the frame in a perpendicular position and is sufficiently removed from the body and frame structure to enable a filling station attendant to insert the gasoline hose nozzle without difficulty or marring the body. A gage placed in the side of the tank also is much easier to read than the type placed in the center of the tank and often obstructed by a touring trunk.

The Climber Motor Corporation shows two touring cars and one roadster. The price on the touring car has been reduced from \$2,250 to \$1,695, while the closed car is reduced from \$2,750 to \$2,250. The price of the roadster is \$1,095.

While this car has been on the market for some time, this is the first time it was shown in Chicago. There are no radical changes from last year's car, with the exception that some body details have been changed. The doors are slightly wider, upholstery is of better material and the chassis has been refined at several points. This car has 125 in. wheelbase and is fitted with a Herschell-Spillman six-cylinder engine, 3½ by 5 in. The company has adopted the latest type of Bosch magneto for the ignition, while the starting and lighting system is a Westinghouse. From the engine the drive is through a Borg & Beck clutch to a Munson gearset and from this to the rear axle in a conventional manner. The rear axle is geared 4.75 to 1. Hotchkiss drive is used for

both propulsion of the car and for torque and brake reaction. The springs are semi-elliptic, 34 by 2 in. front and 52 by 2 in. rear. They are underslung from the rear axle

The frame has a depth of $7\frac{3}{4}$ in. The wheels are of the artillery type and fitted with 32 by $4\frac{1}{2}$ in. cord tires. The body is of the double-cowled type and finished in optional colors.

The Skylark model Lexington exemplifies the completely equipped car. It is a two-passenger speedster selling for \$1,795 f.o.b. factory Connersville, Ind., and makes its first appearance at the Chicago show. Power and speed are emphasized by the lines of this snappy car. Bumpers on this model are not accessories to be purchased after the car is delivered, but are as much a part of the car as the fenders. Wheels are of the disc type with wire wheels optional, five being included as regular equipment. The spare wheel is also supplied with a cord tire and tire cover. The top is capable of being lowered, and, to protect the rear deck, nickel-plated bars are used. Running boards are of the conventional type, but are equipped with aluminum scuff plates.

What is probably the last word in custom-built cars is the McFarlan town car, in which gold plating is the chief feature. This is not merely a show car, but has been built to order, it is said, for a wealthy Chicagoan. The price is said to be \$25,000.

The Dort Harvard coupe makes its first show appearance here. It was not shown at New York. This model is available on either the four-cylinder chassis or on the six, the prices being respectively \$1,240 and \$1,355, f.o.b. factory.

This is a three-passenger job, with seats somewhat lower than in other models and with the top correspondingly lowered to give a pleasing effect. Disc wheels are regular, and an adjustable sun visor is also provided.

Efforts at the Chicago show toward the sale of parts and accessories are made from different angles.

The problem of wear in bearings and cylinder walls is found to be due at least to a great extent to the abrasive action of dust and dirt drawn into the engine with the air that enters through the carbureter. The Stewart-Warner Speedometer Corporation shows a device which, while primarily designed for use on trucks, may eventually be a possibility for passenger cars as well. It includes a series of circuitous passages through which air must pass to the carbureter and, in passing, it goes through water, which is clearly seen in the demonstrating model.

Parts Displays

The water picks up the dust out of the air and later deposits it in a glass jar. Operation of the device for perhaps six hours had already deposited about an eighth inch of dirt in the glass receptacle.

A demonstration of shock absorbing action is made at the booth where Watson stabilators are on display. This demonstration stand comprises a framework on which the stabilator is mounted and a foot-rest on which a person can stand. When weight is first put on the foot-rest, it sinks very slowly, this position corresponding to the upper position of an axle, where the car has hit a bump. As the weight gradually forces the foot-rest downward, it starts to go with increased ease, and at the extreme lower position, corresponding to a spring normally stressed, and operating over small bumps, the action is quite easy. It is now possible to move the foot-rest down with very little effort.

The Elizabethan Room at the Congress housed an elaborate exhibit, which was featured by the Stutz, Kissel, National and Rickenbacker lines.

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vith artThe Tarkington car, a newcomer from Rockford, Ill., was on private exhibition, as was the Crossland steam car, improved over the design of several years ago. The same was true of Durant's Princeton. A brief description of the Princeton appeared in AUTOMOTIVE INDUSTRIES of Jan. 11, while the first chassis photograph of this new job is shown herewith.

The Tarkington, the latest addition to the six-cylinder field, has a number of interesting features from an engineering standpoint. The wheelbase is 126 in.

Among the unusual features of this car is the rear axle, composed largely of aluminum and so arranged that the rear springs are mounted inside the frame. The front axle is also quite unusual, in that it is fitted with knuckles of the reversed Lemoine type inclosed in wells containing sufficient oil for an entire season.

A valve-in-the-head type of engine is used. This has a $3\frac{1}{2}$ -in. bore and $4\frac{1}{2}$ -in. stroke, giving a piston displacement of 260 in. The cylinders are cast in a single block and the crankcase is of aluminum. Both manifolds are on the outside of the block. The mixture is heated by passage through an exhaust jacketed portion of the inlet manifold, the entire exhaust being carried through the center of the cylinder block.

A pressure lubricating system is so arranged as to feed oil under pressure to all bearings, including wrist pins. The oil pump assembly is located at the lower forward right side of the engine. It can be easily removed by breaking two oil leads and unscrewing four cap screws. Oil pressure is controlled by the throttle position.

All crankshaft bearings are $2\frac{1}{2}$ in. in diameter, the

lengths being as follows: The front 3 in., center 3 in. and rear 4 in. The center bearing is arranged to take end thrust. Connecting rod bearings are 1\% in. in diameter. The crankshaft is statically and dynamically balanced.

Push rods are of aluminum with steel cups at the top and steel balls at the bottom. Oil runs down the push rods from ducts in the rocker arms, thus lubricating and cushioning the entire valve lifter assembly and the cam.

From the engine the drive is through a dry-plate clutch to a three-speed gearset, which has an aluminum housing, nickel-steel gears and operates on annular ball bearings.

The semi-floating rear axle has Lynite center housing and end castings. The steel axle tubes are 3 in. in diameter and are shrunk into the center housing. The differential has a four-pinion spider, and Timken bearings used throughout. The entire differential can easily be removed through the rear of the center housing. Axle shafts are splined into the differential.

The Jacox steering gear is fitted with an 18-in. wheel and has dimmer switch and engine controls mounted in the hub. Springs are semi-elliptic, front and rear.

The front axle is an I-beam, drop forged and heat treated. It is of the reversed Lemoine type, with king pin reservoirs said to hold sufficient oil to last an entire season. Ball joints connect the tie rod to the steering knuckle arms. These balls are ground and polished and are fitted with metal caps for excluding dust and water.

The side rails of the frame are 8 in. deep and the frame has a $5\frac{1}{2}$ -in. kickup at the rear. The running boards are of laminated wood construction.

Single Market for New and Used Cars, Tipper Says

Dealer and manufacturer both have direct interest in second-hand cars. Service grows in importance. Departmentalized retail organizations necessary.

DISTRIBUTORS and dealers from all parts of the country are gathered in Chicago for the anual convention of the National Automobile Dealers' Association. Practical problems of profound interest to the entire industry will be discussed, such as the used car question and improved merchandising methods. One of the speakers whose views were heard with much interest was Harry Tipper, business manager of AUTOMOTIVE INDUSTRIES. In his address he said:

ONE of the more important problems confronting you—and one which has caused a great deal of discussion—is the problem of the used car. In manufacturing and distributing circles the question of the used car, its valuation in trade, its conditioning, its resale and the market for it have been the subject of much controversy and, in some cases, almost bitterness of argument. This discussion has been conducted as though the market for used cars was a separate and distinct portion of the vehicle market and could be so treated. There is no foundation for this assumption except our own methods of consideration. The car market in any locality is one market, and the sale of cars in that locality will meet the market, distributing the used and new vehicles almost entirely because of the relation between their values.

The car is a piece of transportation machinery, and all machinery has been subject to trade, to second-hand sale, repair and rebuilding at all times. This problem is one which can only be solved by the manufacturer and the dealer arriving at a thorough understanding of the conditions affecting it.

In the discussions upon this point a good deal has been made of conditions in the piano trade, the type-writer and other lines of business, and there are advocates in the automotive industry today of a system of separating the used car business from the new car business entirely, eliminating the trade as a part of the new car sale and permitting it to be dealt with through entirely new developments.

There is one feature of the automobile business, however, which must be taken into consideration at all times. That is the car dealer who is handling a particular make of car is interested in the second-hand cars of that make and the manufacturer who is making those cars is also interested, because so long as a car of a particular make is running it is either adding to or taking away from the reputation of the concern in that locality.

Whatever solutions are arrived at to satisfactorily balance the new and used car values, the car dealer and the car manufacturer cannot escape a very vital interest in the character of the used car sale and the conditioning received between sales.

Used car trades will remain a definite necessity of new car sales, and the proportion of trades will constantly increase. If the used car values in trade are too high, new car sales will be made at the expense of used car movements. If the used car values in trade are too low, the used car movement will be temporarily in advance

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of the new sales. In either case, however, the movement of the car from the factory to the junk pile must be balanced sooner or later.

For these reasons the condition of sale or trade on used cars should be as follows:

The allowance for the used car should be based upon the general market conditions and the probable depreciation, less the cost of conditioning and the percentage required to house, resell and provide a profit on the resale transaction. Suppose, for instance, that a car is offered in trade and its market value for sale is \$600. Suppose, further, that it will take \$100 to recondition the car, it will cost \$20 to store it, and \$120 should be made as an allowance for the cost of selling and profit. Then the proper trade price for that car would be \$600 less \$240, or \$360.

It may be contended that this allowance for reselling and profit is too great, but the allowance for selling and profit on the used car should be not less than the allowance for the new car, because the effort to sell cost just as much and the fluctuating market may eliminate the profit on some or cause a loss before they are sold, which loss must be taken up by the additional profit secured on others.

Sooner or later, in each locality in the country, the proportionate price for used cars of a certain age and make must bear a decent relation to the new car prices for the same product so that the flow is orderly and there is no choking at one or the other end of the line. Sooner or later the manufacturer and car dealer will understand that every car of a certain make, running and in service, is adding to or taking away from the reputation of that manufacturer and the sales possibilities of that dealer.

Market Analysis Needed

The problem of securing all possible information which would be of advantage to the car dealer in developing his business is a problem concerning all companies engaged in providing products for the car or in providing the vehicles themselves. It is not the dealer's problem alone. The manufacturer can be of great service to the dealer in working closer with him as to the best methods of meeting the problems that are constantly coming up, and the distributor can enhance the value of the dealers

in his territory by operating in the same way.

This is the largest industry in the country and the only large manufacturing industry where the contact of the manufacturer with the user is direct and specific. For this reason the factory and those engaged in distributing are mutually concerned in the solution of all problems related to distribution, and they will be solved successfully only by the mutual consideration of them.

Authority of Car Dealer

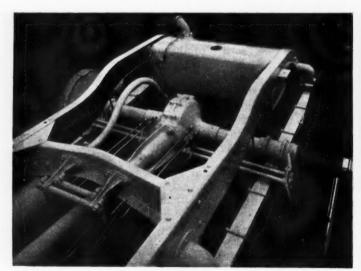
We are still inclined to consider the car dealer as a separate individual or organization from the service station, the repair shop and the garage. This is fast becoming obsolete as a method of consideration. The car dealer representing a certain car in his locality and selling that car to the people of the locality has, by a logical extension of the market pressure, added facilities for service and repair of the car and the sale of accessories, some of which are required when the car is bought, but also required from time to time while the car is running.

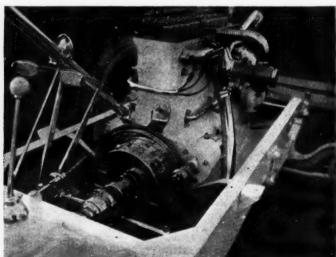
The period of most rapid growth in the automotive field has passed. The period of intensive cultivation of the market is just beginning. The car dealer must be prepared to make less money on the unit of sale and more money by extending his efficiency of sale, seizing upon every outlet for the development of the best possible business. This means an analysis of sales possibilities in his area and of the conditions involved.

The reaction of the customer is largely built upon trifles. The car dealer who services and sells a car should represent complete authority on that car in the minds of the owners. This authority is secured partly by the good work done and the fact that representations are never greater than the performance, partly by the care of all trifling details in which the customer figures and partly by the application of all promotion work to the local conditions.

The business of servicing the car will grow in the future faster than the business of sale or new production, so that service repairs and supplies will become increasingly important in the possibility of adding profit to the car dealer's business. This, of course, means a more careful departmentalized establishment with its details under adequate supervision and intelligent understanding.

Features of New Princeton Chassis





Rear and front ends of the new Princeton chassis. Note substantial construction of frame and separately mounted gearset

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Manufacturing and Shipping Costs Cut by Building Bodies in Sections

Thirty broughams packed in same freight car space as 14 under usual method. Oldsmobile has plan in successful operation. Body is shipped in seven sections from Milburn plant. Bolted and screwed together in car factory. Service problem minimized.

By J. Edward Schipper

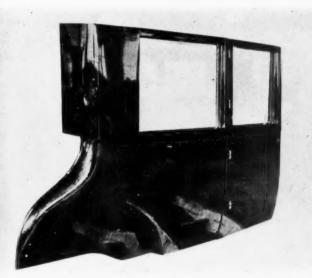
DRASTIC cut in manufacturing and shipping costs by use of interchangeable sectional construction promises to be the next development in body manufacture. One concern has already increased the number of bodies shipped per freight car nearly 200 per cent by the new method. Depending on the type, sections numbering anywhere from four to ten per body are capable of ready assembly and produce rigid durable units. The fact that the sections are strictly interchangeable opens up interesting possibilities in body service and parts replacement.

The industry has sensed for some time that body building is on the eve of some important and far-reaching changes. The demand that closed body prices be brought closer to the open car level has made body production methods the subject of intense study. The sectional body, according to its sponsors, will effect direct economies by hitting all five of the big causes for high closed body prices. These are:

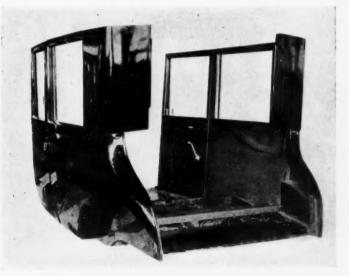
- 1. High cost of trimming and upholstery.
- 2. Tremendous factory space required.
- 3. Long painting time.
- 4. Unsuitability to progressive methods.
- 5. High freight costs.

The ultimate aim is for the car manufacturer to receive, clean, paint, trim, and all but finish-varnish these sections before assembling them into complete bodies. Instead of having acres of floor space covered with complete bodies in various stages of trimming and painting, the car manufacturer can reduce his problem to a section stock room which requires only a small fraction of this space. The sections can be painted and trimmed in progressive line system and the trimmed and painted sections need be assembled into complete bodies only as needed. These sectional bodies go together like any other units with interchangeable parts, and the sections are suitable for progressive manufacturing methods. Being sub-assemblies they are easily handled and the saving is obvious.

While the ultimate in sectional construction is not yet here, a considerable stride has already been taken toward it. The Oldsmobile Brougham, which was introduced at the New York show, is built sectionally by the Milburn Wagon Works, Toledo, and shipped to the Lansing factory in carload lots, thirty to the car, where the bodies are assembled, painted and trimmed. The saving in freight which has resulted from the sectional construction is considerable. It was formerly possible with a great amount



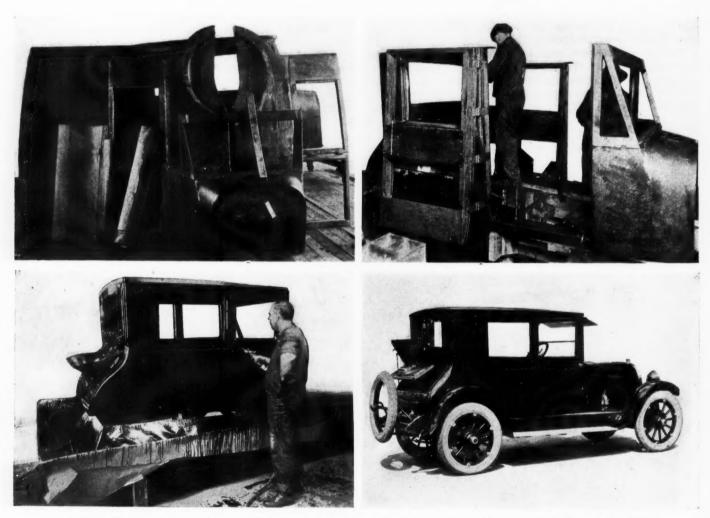
One of the seven sections which compose the Olds brougham body



This illustrates a partially assembled sectional body which has been painted and trimmed by the body manufacturer. This may be the eventual development of the sectional body



The bodies are trimmed progressively. If the sectional system is carried to its apparently logical conclusion, this work is all done on the individual pieces before assembly



Upper left—The seven sections which go to make up the Olds brougham as they are received at the factory from the body manufacturers. Upper right—Two men assemble a brougham body at the rate of five per day. Lower left—Color varnish is applied by flow-coating below and by brush above the belt. Notice the paper lining to the drain trough. Lower right—Oldsmobile brougham which is shipped in seven sections from the Milburn Wagon Works, Toledo, to the Olds factory at Lansing, where it is assembled, trimmed and painted

of ingenuity to nest fourteen bodies in a 40-ft. freight car. In sectional form it is now easily possible to put the thirty Broughams in the same space.

Milburn ships this body in seven sections. It is a twodoor five-passenger type, entirely of wood and steel construction, with the exception of the roof, which is covered with high grade deck material, laid over heavy padding. The seven sections are: 1-Cowl and pillars; 2-roof; 3-complete left side including door; 4-complete right side including door; 5-rear panel; 6-rear deck door and tool compartment; 7-tail piece. All of these parts are interchangeable and are in the raw, being simply covered with a rust-preventing coat.

First Step in Assembly

The first step at the Olds Motor Works is to assemble the bodies. This is done on regular bucks with the customary clamps. The sections are mortise wedged, glued and screwed together, so that when complete they are rigid, strong bodies. Two men can assemble five of these bodies per day. At the Milburn plant about fifteen out of every 100 sets of sections are assembled to check for accuracy and interchangeability. In the construction of the body, wherever it is feasible to do so, bolts are used in place of the ordinary wood screws. For instance, there are 17 bolts fastening uprights and roof, besides the usual number of screws, and in the entire body there are 28 bolts.

After the bodies are assembled they are inspected for high spots and any other surface imperfections. anti-rust coat is rubbed off with steel wool and acid followed by a thorough washing with steam and hot water. The bodies are then sprayed with a coat of red metal primer. It will be noted that there is no attempt to weld the sections together. These are so designed that the structure possesses unusual stiffness and the sections are large enough so that all the necessary welding has been done at the Milburn plant. The bodies follow standard closed car practice with pillars, frames and braces of selected hard woods covered with steel panels from floor to roof.

Painting and Trimming

The bodies are put through a regular paint and trim schedule which does not deviate from regular practice except that it is rather unusually complete in consideration of the price of this body. The average time required to send the body through is 14 days. The schedule is as follows:

W.S.	
Process	Average Let Stand
Prime and slush	24 hours
Lead door jambs	36 hours
Glaze	24 hours
Spray sand surface 1	24 hours
Spray sand surface 2	24 hours
Rub and clean up.	
Color spray 1	24 hours
Color spray 2	
Color varnish 1	
Color varnish 2	
Trim.	
Rub varnish.	
Stripe, clean all glass and black off.	
Finish varnish	24 hours

The color varnish coats are flow-coated below and brushed on above the belt line. The bodies are carried through all these steps on a standard truck which even goes into the painting bays. The paint drip troughs are so arranged that a track for the standard truck passes into the bay and the paint drains into the troughs on the sides. A rather novel scheme is the use of paper linings in the drain troughs. The linings are put in clean each

morning and there is consequently no danger of clogged drains with semi-dry paint. Furthermore, if a different color paint is used there is no danger of mixing with that which has drained off previously.

The bodies are trimmed progressively along a regular line in the same way that bodies made in the usual manner are handled. The line parallels the upholstery stock and the trimmers apply in order; the roof lining, rear seat lining, door pillar lining, cowl trim, body wiring, rear corner, side wall and door lining upholstery, piping, heater, curtains, door stops, seat backs, hardware, instrument board and dome lights. The last station on the line tests the body wiring.

Following the upholstering, the body is returned to the paint shop where it is rubbed down, cleaned, striped and finish varnished in a dust-proof room. The drying room for the finish varnish is immediately adjacent to the finish varnish room and is walled off from the rest of the plant so as to safeguard this finish coat. After leaving this department, the bodies are dropped on the chassis assembly line in the usual manner. The seats are put in after the car is complete. This not only keeps them clean, but allows more room for working inside the bodies.

It is apparent that this system of building the brougham takes the sectional body through only one step. It is not too much to predict that it will not be long before the industry will at least make a thorough trial of the other possible phases of this type of construction. As far as the sectional method is concerned, the bodies produced are just as rigid as those built by any other means. Thorough

tests on this brougham by both Milburn and Olds have convinced these companies that the plan is successful.

Saving in Factory Space

The ability to cut the freight cost in half and the saving in the factory floor space made possible by the fact that the bodies do not have to be assembled until the manufacturer is ready to use them are material factors in cutting the costs. This neglects the other benefits to be derived such as eliminating the necessity for expensive labor working in cramped and exhausting positions.

It also facilitates service, which is important. On the Olds brougham, for instance, if the roof is badly damaged, it is a relatively simple matter to take it off and put on another with the assurance that the new one will fit. No trouble of any consequence has been found in making the parts interchangeable. There is no effort for selective assembly at the Olds plant. The parts all fit.

Dial Test Indicator Attachment

THE Brown & Sharpe Mfg. Co. has added to its line of precision tools a dial test indicator attachment which adds to the usefulness of the dial indicator in rendering it suitable for testing internal and other surfaces not easily reached with the regular straight spindle. The arm is a bronze casting. The device is easily attached and the fact that direct contact is made between the test bar and the dial plunger saves the time of the operator.



Brown & Sharpe dial indicator

Just Among Ourselves

Wall Street Worrying (?) About Durant Plans

WALL STREET seems to be worrying frightfully about what is going to happen to the Durant enterprises because of the hammering which has been given Fisher Body stock and the proposal to increase the capital of that corporation. This worry, which is about as sincere as that you feel when your worst enemy stubs his toe, is based on the fact that Durant has sold Fisher stock to his "partners" on the installment plan. When Durant officials are asked about it they just grin. They assert cheerfully that the stock is worth more than they charged for it, which it probably is. Durant's purchases of stock in thoroughly sound automotive companies are in no sense mysterious. He is selling the stock, on the installment plan or otherwise, to the patrons of the Durant Corp. in the expectation that its value will increase. When he buys a block of stock it doesn't mean he is trying to get control of the company. He is not buying it on a margin basis. His friends say that when the price of what he considers good "buys" is hammered down, he buys for cash.

Makers of Other Cars Back Assembled Job

S PEAKING of stock transactions, there is one company making a specialized unit passenger car in which several of the largest parts makers are interested financially. They are backing it, to all intents and purposes. That is not surprising, for if it makes the success they expect it will they will have a substantial market for their products. The surprising part is that men heavily interested in at least two other companies, which are cataloged under those making their own parts, also are stockholders in the corporation turning out the assembled creation. Incidentally, there is no such thing as a company which makes all its own parts.

Sanders Speaks Freely of Sales Managers

B. SANDERS, head of the Boston Used Car Statistical Bureau, which appears to have the best plan yet evolved to save dealers money on trade-ins, talked to the motor truck manufacturers at their session in New York show week. He didn't hesitate to express his views on the amount of cooperation given dealers by most factory sales managers.

"Most sales managers," he said, "will come to the distributor, call a dealers' meeting, tell why their truck or passenger car is going to sell because they have changed a cotter pin here or something else there; then find fault with the brand of hooch you furnish and then see how quick they can get on the golf links or in a poker game. Very little time is spent helping the dealer or branch manager study local conditions, help remove sales resistance or close sales."

Factory Branch Refuses to Aid Boston Plan

UTOMOBILE distributors A and dealers in Philadelphia have agreed to adopt the Boston plan of maximum allowances for used cars. One factory branch, which has a liberal trading allowance, has refused to cooperate with the dealers and is using much space in the newspapers to announce that it will make liberal allowances in trades. The dealers' association is using smaller space to inform the public that this particular branch has been expelled from the organization for an infraction of the rules. It is interesting to note that this company's business in Boston is handled by a strong distributor and that he is cooperating closely with the other dealers in that city.

Urge National Campaign of Dealer Education

E have heard recently from three men engaged in entirely different branches of the automotive industry the suggestion that the big organizations of the industry, including the N. A. C. C., the N. A. D. A. and the M. A. M. A., cooperating with individual factories, should undertake a great national campaign of dealer education These men are agreed that there is much common ground on which all the elements of the industry can unite with profit to themselves and to each other. It is another indication of general recognition of the fact that the entire industry must make a great improvement in its merchandising methods. It means also that the dealer is conceded to be a much more important personage than he has been in the past. Automotive products are approaching a commodity basis in their handling, and profits will depend on the rapidity of turnover. Cooperative effort in a campaign of merchandising is well worth thinking about just as it would be in a campaign of constructive publicity.

Proposes to Have Dealers Form Distributing Companies

THE Anderson Motor Car Co. of Rock Hill, S. C., has worked out a novel plan which it hopes will settle the question of distributors. It proposes to organize distributing companies with the dealers in the territory served as the stockholders. Each company would hire its own manager and the dealer-stockholders would divide the profits accruing from the factory distributor discount. It is believed such a plan would help dealers solve their financing troubles and that it would bring them into a closer and more sympathetic contact with the factory. These distributing companies

More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

probably will be formed first in the South, where the factory can watch their operations more closely.

Truck Buyers Will Ask Same Lists for All

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THE National Retail Dry Goods Delivery Association, made up of transportation superintendents of large department stores in all parts of the country, has a grievance against certain truck and parts manufacturers which it proposes to air at a convention in the near future. The grievance is that these manufacturers have no established list prices to which they adhere. Reports made by members are said to show that a store in one city may be sold a certain number of trucks of a certain make for one price while a store in another city may be sold a larger number of trucks of the same make for a higher price. The same situation is alleged to prevail in relation to certain parts and accessories. The association is considering advising its members not to buy from companies which do not adhere to their list prices. Here's a little more grief for the truck makers particularly. Conditions in that field have reached a point where they resemble in a good many respects those prevailing in tire merchandising.

Trolley Men Friendly to Motor Vehicles Now

C. FENNER of Mack Trucks represented the automotive industry at the midwinter meeting of the New York Electric Railway Association in New York. His subject was "Fundamental Principles of State Motor Vehicle Common Carrier Regulation." He had a fairly sympathetic audience, for the street railway men realize that they'll all have to get into the motor vehicle field sooner or later. A good many of them are in

already. Fenner outlined what has been done in the way of State regulation and what is proposed. He also read the declaration of principles adopted by the Motor Vehicle Conference Committee, which is not so far removed from that of the National Electric Railway Association on the same subject. It was significant that when Fenner had finished, B. F. Tilton of Syracuse, president of the State association, remarked:

"The time of the motor vehicle common carrier is not coming, but it already has arrived. We must be prepared to cooperate with the automotive industry."

Present Congress Unlikely to Enact New Tax Laws

EDERAL taxation is mighty important subject for the automotive industry. The Government is looking for new sources of revenue but no revenue bill will be enacted at the present session of Congress. President Harding calls a special session, which now seems unlikely, the industry can rest in peace for another year so far as taxation is concerned. If there is a special session, however, there may be a different story, for the present Republican congressional leaders have some rather definite ideas on this subject. Even if Congress does leave them alone for a while, the industry and motorists generally will have trouble enough with State legislatures which not only want more revenue but are determined to restrict and regulate motor vehicles more closely.

Bankers Are Convinced Industry Is Sound

A NNUAL reports of automotive companies are beginning to come through. The most interesting features, generally speaking, are the increase in the amount of cash on hand and the decrease in the amount of money

tied up in inventories, as compared with the reports last year. Leaving out of consideration some of the smaller companies which are weak financially, the industry is on a very sound footing. The bankers of the country, big and little, are beginning to recognize this fact. They have learned in the last two years that the motor vehicle is an agency of transportation which cannot be overlooked in any present or future consideration of the industrial fabric. They have ceased to regard it as a plaything. They are disposed to extend all reasonable accommodation not only to firmly established manufacturers but also to dealers who are real merchants conducting their business on a sound business basis.

Outlook for Business Pleases Parts Makers

N amazing change has come A over the atmosphere of the industry in a year. At the beginning of 1922 it was one of hope and now it is one of confidence. This situation applies not only to vehicle manufacturers but parts makers as well. They feel that the outlook for the next six months scarcely could be better. Collections are good, past due accounts have been reduced to a figure below normal and sales are excellent. The aggregate 1922 original equipment sales of members of the M. A. M. A. who file monthly reports with that organization were \$419,000,000, as compared with only \$238,000,000 in 1921. The fly in the ointment is the size of the profits. Practically all parts companies are making money, but not as much as they feel they should on the volume of business done. They are wondering how far they would get if they were to raise their prices a bit. They would like to do it, but they don't want to rock the boat when it is sailing along

Determining Correct Carbureter Size

Practical method evolved for calculating cross section of venturi tube necessary that carbureter may permit quick acceleration from minimum car speed in high gear.

By W. H. Weber

THE following method of determining carbureter venturi diameters was suggested by the observation and study of a number of cars successfully "carburetted"; that is, so equipped as to accelerate rapidly when the throttle is kicked wide open at 5 m.p.h. with the car in high gear. Five miles per hour is an arbitrary minimum speed and would represent heavy traffic driving. It is always an agreeable feeling under such conditions to be able to "step on her" when the chance affords, with immediate response.

As a practical example let us consider a motor so geared as to revolve at 400 r.p.m. when the car is traveling at 5 m.p.h. in high gear. At ten times this speed, or 50 m.p.h., the motor will revolve at 4000 r.p.m. We will assume that a venturi of 24 mm. diameter gives satisfactory acceleration. If, now, we put this same engine in another chassis and gear it so that the engine revolves at 200 r.p.m. when the car travels at 5 m.p.h. (or 2000 r.p.m. at 50 m.p.h.) we could not reasonably expect to step on the throttle with similar results, with a 24 mm. venturi in the carbureter. Such a venturi would be entirely too large for low speed and flexibility.

This brings us to the basis of the suggested method. If we calculate the air speed at the throat of the venturi in the first case, where satisfactory results were obtained, and select a new venturi for the second case such that the air speed at 5 m.p.h. is the same, is it not reasonable to expect that such a venturi will be sufficiently large for high speeds and will also give good acceleration from low speeds? In other words, is it not a reasonable assumption that flexibility, obtained by the selection of a proper carbureter venturi, is a function of air speed through the venturi and is directly dependent upon the cross sectional area of the throat? There will no doubt be cases in which a calculated venturi will seem too small for the engine, but this will only happen when the gear ratio is exceptionally high, that is, when the engine runs relatively slow and a seemingly small venturi is plenty large to supply sufficient mixture.

The air speed through the venturi is a direct function of-

> engine displacement, venturi area and engine speed,

and of several physical variables which it is not necessarv to consider here.

In working out the following formula the piston displacement of one cylinder only is taken, since only one cylinder draws in charge at a time. The idea exists among some engineers, especially with reference to six-

cylinder engines, that where, for example, a single 11/2-in. carbureter is required for maximum torque, two smaller carbureters may be used to advantage, the inference being that two small carbureters should be able to deliver as much charge as a single large one. There is an advantage in using two carbureters on six-cylinder engines, as has been practically demonstrated, but these carbureters must be of the same size as the single one. It may be stated here that the advantage of two carbureters lies in each cylinder receiving a maximum charge by virtue of using two manifolds. The firing order, 1, 5, 3, 6, 2, 4, indicates that in the case of a single manifold and carbureter the flow of mixture must constantly change direction (from 1 to 5 to 3 to 6 to 2 to 4) and where intake valve openings overlap, the cylinder just commencing its intake is robbed of part of its charge. Where cylinders 1, 2 and 3 are fed by one manifold and cylinders 4, 5 and 6 by another, this cannot occur. The advantage of a duplex installation on a six-cylinder engine was clearly demonstrated on the Sunbeam engine.

Experiments with One Cylinder

Returning to the reason for considering only one cylinder, this is clear if a single-cylinder and a four-cylinder engine are compared. There are four strokes to the cycle. If a cycle is performed in unit time, in the case of the single-cylinder engine the carbureter must supply one complete charge per time unit, but it must do this work during one stroke or actually in one-quarter of a time unit. In the case of the four-cylinder engine four charges must be delivered in one time unit, but only one complete charge is supplied per stroke or in one-quarter of a time unit, just as was the case with the singlecylinder engine; hence, although the first carbureter is supplying only one-fourth the total amount per time unit, it must supply exactly the same amount of charge per stroke, and hence we must use the same size of carbureter in both cases.

Let D, be the displacement of one cylinder (cu. in.);

d, the rear wheel diameter (in.);

GR, the gear ratio;

K, a constant based on successful carbureter set-

 EA_c the effective area of the venturi (sq. in.).

 $RPM/2 = \frac{5 \times 5280 \times 12 \times GR}{60 \times d \times \pi}$ (at 5 m.p.h.) $= \frac{840 GR}{d}$ $EA_c = \frac{D_1 \times 840 \times GR}{dK}$

 $\it K$ as determined from many Claudel carbureter settings is equal to 14,200.

Hence

$$EA_c = \frac{D_i \times GR}{17d}$$

The effective area of the venturi (EA_c) is equal to the area of the throat minus the area of the jet or any other projection obstructing part of the gross area of the venturi throat.

In the case of the Claudel carbureter the following table was calculated, and a similar table can be prepared for any plain tube carbureter. By means of the formula the necessary effective venturi area (EA_c) can be ascer-

tained, and it is then only necessary to refer to the table to determine the corresponding venturi size.

Values of EAc		_Values of EAC_			
Venturi Throat Dia. mm.	Models C-4 and C-5	Model C-6	Venturi Throat Dia. mm.	Models C-4 and C-5	Model C-6
15	.099		25	.586	
16	.136		26	.649	
17	.177		27	.712	.576
18	.218		28	.780	.641
19	.264		29	.848	.712
20	.312		30		.784
21	.362		31		.860
22	.414		32		.935
23	.468		33		1.014
24	526		34		1.096

Training the Electrical Service Man for His Job

New publications present valuable material on this and other subjects for study by the manufacturing executive

THE needs of the electrical service man are considered from the standpoint of training for the job in "Automotive Repair, Volume 2, Electrical Service Work," by J. C. Wright. The principal repair jobs which make up the work of the electrical service shop are analyzed into operations which must be performed in order to make repairs, the descriptions of the operations being illustrated by cuts of important parts and operations entering in the doing of the actual repair work.

Part I contains working instructions for 56 electrical repair jobs, while Part 2 gives that part of the theory of electricity which is needed by the repairman for the thorough understanding of the function of each electrical

unit.

The author is director of the Federal Board for Vocational Education and was formerly chief of the Industrial Educational Service, Federal Board for Vocational Education. The volume is published by John Wiley & Sons, Inc., New York.

With keen sales competition necessitating a closer knowledge of the market, and sales dependent on the shading of prices as never before, manufacturing executives should find a study of budgetary control of vital importance.

There are many books published which deal with the details of budget-making within the departments of an organization, but for the executive who wishes to view the problem in its larger aspect, that of the interrelationship of departmental budgets, "Budgetary Control" by J. O. McKinsey will be found to have great value.

This work, published by The Ronald Press, deals with the budget control of all departments of an organization and is written in a manner to permit a grasp of fundamentals without going too deep into detail.

The chapters on the sales budget are of particular importance for, as Mr. McKinsey states, the sales budget is the keypoint to the whole budget system within an organization. He says: "The object of the operation of a business is to make a profit, and sales conclude the process which results in the making of a profit."

It might be that on reading the chapters on sales budgets one would feel that the difficulty in estimating future sales accurately is well-nigh overwhelming, but we are led out of this maize by the assurance that a budget must be started no matter how inadequate, and from that better and better budgets may be set as years go by and more accurate statistics are gathered.

R. Conrad, editor of *Der Motorwagen*, and perhaps better known in this country as the inventor of the annular ball bearing without filling slot, in a pamphlet entitled "Zur Kritik Einiger Neuer Versuchsrichtungen im Automobilbau," passes in review the new tendencies in automobile design observed at last year's Berlin automobile show. He discusses the novelties not as designs but as regards the ideas embodied in them.

Among the devices and complete cars described and critically studied are the Maybach car and particularly the Maybach carbureter, the Louis Renault hydraulic drive, the Lentz hydraulic drive and hydraulic and pneu-

matic operation of the friction clutch.

He describes the Grade friction drive, the Soden transmission with automatic gearshift, super-dimensioned engines, super-compression engines, the Zoller two-stroke engine with blower as well as other two-stroke engines, the Rumpler "drop" car, the touring car designed by Cassalette and the N. A. G. transmission with geared-up fourth speed.

The pamphlet contains 32 pages of technical description with illustrations. M. Krayn, Berlin, is the publisher.

A treatment of mechanical road-transport risks has recently appeared from the pen of a British author. Since British insurance practice is bound up inseparably with the laws of that land, the book will hardly serve as a source book for those who contemplate taking out automobile insurance in this country. However, for the sake of comparison between insurance practices or for study of insurance problems the work has value on this side of the water.

"Motor Insurance" is written by W. F. Todd of the Ocean Accident Guarantee Corporation, Ltd., and is published by Sir Isaac Pitman & Sons, Ltd., who have head-quarters in New York.

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Trading Discounts Make Used Car Problem Acute

"Inside billings" give aid to a Frankenstein which may throttle industry. Manufacturers cannot permanently force market. Dealers must be given help on used car difficulties. Keen competition may necessitate smaller profits per unit and reduced selling costs.

ANUFACTURERS as well as dealers are gravely concerned over what is called, for lack of a better term, "the used car problem." There is no fear that it will wreck the industry, but it certainly will wreck many dealers and it will cost manufacturers dearly unless something really constructive is done to eradicate the evil.

Many vehicle makers have contended that it is a question which does not concern them but must be handled by every individual dealer for himself. Up to a certain point that assertion is true, but beyond that it is a myth. The used car problem was begotten by keen competition and it has been fostered by manufacturers striving desperately to increase their sales.

Officially there is no such thing as a trading discount. The general sales manager of one large company declared not long ago that he had tried vainly for months to obtain evidence that any company was granting such discounts. If you get out among the dealers, however, it doesn't take long to find that the trading discount is a very real institution even though no company will give it full social recognition.

Every one in the industry is thoroughly familiar with everything the term implies and no definition is required. It may be called by many names, but its features are always the same underneath the mask. Every factory which gives a trading discount, no matter what it may be called, is deliberately giving aid and comfort to a Frankenstein which is throttling the industry.

It has built up an atmosphere of unrest and discontent in dealer organizations which it would be difficult to exaggerate. Many sound and able dealers either are going out of business or are threatening to do so. They declare they propose to save what they can out of the wreck of their business and in numerous cases sacrifice the effort of years. Rightly or wrongly they blame the factories for most of their troubles.

Dealers Want Longer Discounts

A majority of the dealers will assert that they should have longer discounts, but under present conditions this wouldn't help them much for most of the extra income probably would be used in cut-throat trading and they would be no better off than before. No one ever has determined scientifically exactly what discount an automobile dealer must have to enable him to do business at a fair profit. Until there is some such basis upon which

to work there always will be wide differences of opinion.

Various associations of dealers have worked out practical plans for mitigating the used car evil without running counter to the Sherman law. These plans are called by many names, but fundamentally they are about alike. Most of them are workable if all the reputable dealers in any community, large or small, will play fair and cooperate. Up to this time individual manufacturers have done mighty little to promote such plans among their dealers, although the National Automobile Chamber of Commerce has made a survey of the situation and gathered data about all kinds of plans. Any factory can afford at least this much missionary work.

Limit to Forcing Market

The biggest thing factories can do, however, is to put their sales on a sound basis. Nothing is to be gained permanently by forcing business to such an extent that dealers are ruined in the process. When trading is on a basis where perfectly good cars are turned in for new ones which are little better except that they have fresher paint and a few minor new appointments, no one gains anything, not even the purchaser.

These high class used cars often go to first purchasers who would buy new automobiles were it not for the fact that they can get wonderful bargains at the expense of some dealer who is trading his head off. There always will be used cars, but they should be bought and sold at fair prices. When a market is forced as it has been this year and last, it means that fewer sales will be made, sooner or later.

Keen competition is perfectly legitimate and it must be expected for years to come, but when it reaches a point where it is ruinous to dealers who are forced to bid against each other for the privilege of buying used goods, the maker of the goods ultimately will suffer severely. He is dependent for sales upon a corps of successful dealers and they cannot be successful if their profits are conspicuous chiefly by their absence.

It may be that the automotive industry has entered upon such a highly competitive era that both makers and sellers must be satisfied with a smaller margin of profit per unit, but if this is true some means must be devised to reduce operating costs.

The average automobile manufacturer has not yet come to a realization of the fact that what he needs is a wellrounded, financially stable dealer organization rather than men who are experts in the one work of selling new car". When dealers are convinced they can make additic al profits by the sale of equipment and when they are shown how to do it, the automobile makers they represent are distinctly benefited.

When the new car is sold as well as the used car ch came with it, the dealer hasn't added materially to his prosperity, but if he cultivates the "after market" which is created by the sale of every automobile, he entablishes a source of revenue which continues until the.

is run into the junk shop.

f every dealer who sells a new car would keep in touch with that car throughout its life and take from it a' the profits which are in it, he would make more than he does on the original sale. If they were taught how to cultivate this "after market" it would be possible for them to come through periods of depression and slack sales without disastrous consequences.

This after market is constantly increasing as more cars go on the roads and its possibilities of profit become greater and greater. Those dealers who cultivate it can assure themselves a constantly flowing stream of profits.

Here is another field in which car makers might profitably educate their dealers while they are trying to do something really constructive to help them solve the

used car problem.

The statement by Alvan Macauley, president of the Packard Motor Car Co., in reference to the used car evil, reprinted in Automotive Industries from Motor World, is an encouraging indication that far-sighted manufacturers are alive to the perils of the situation.

Highway Construction in 1922 Breaks All Records

LL records for road construction in the United States were broken during the fiscal year 1922, according to the annual report of the Bureau of Public Roads, United States Department of Agriculture. During that period 10,000 miles of Federal-aid roads and more than an equal mileage of highways without Federal assistance were constructed.

From the viewpoint of Federal-aid progress the year divides itself into two periods, one before and the other after the passage of the Federal highway act. The first period was a season of great construction activity during which the greater part of the work of completing the 10,000 miles was done. It was also one of almost complete stagnation with respect to the initiation of projects.

When the year opened there was an unobligated balance of \$18,793,544 of the Federal-aid appropriations and the projects initiated since the beginning of the work aggregated 35,402 miles. By the end of October, 1921, the unobligated balance had been reduced to \$11,-714,328, the lowest it had been since 1918. Only two states at that time had a balance of more than \$1,000,-000, to draw upon for new projects, and a number were so reduced that their balance was not sufficient to pay for another mile of road.

Just before the passage of the Federal highway act the mileage submitted by the States had not grown during the fiscal year, but had actually diminished as a result of the withdrawal and substitution of projects. The total mileage proposed was only 35,379 miles as compared with the 35,402 miles of four months before. Immediately upon the approval of the act the initiation of projects took on new life and in the months of March and June reached the unprecedented total of 1250 miles a month. At the close of the year the submitted mileage is 39,940 miles, 4538 miles greater than at the close of the preceding fiscal year.

At the close of the preceding year projects completed aggregated 7469 miles and there were 17,978 miles under construction, which were estimated as 50 per cent complete. In one year the completed mileage has grown to 17,716 miles, an increase of more than 10,000 miles, and there still remain under construction 14,513 miles, which are estimated as 56 per cent complete. The Federal-aid earned by the States on completed and uncompleted projects amounts to \$194,560,135, of which \$166,911,552 have actually been paid.

The roads brought to completion during the year average over 200 miles for each State. The greatest increase is in Texas, which has added 933 miles to its completed highway. Arkansas, Georgia, Iowa, Minnesota and North Carolina, each with an increase of more than 500 miles, and Montana and Wisconsin, with more than 400 miles, made notable advances toward the goal of a completed highway system.

A number of smaller States, such as Louisiana, Maryland, Massachusetts and Rhode Island, made very sub-

stantial increases in proportion to their size.

The largest payment of Federal aid during the year also went to Texas, which received \$5,915,046 and earned nearly \$2,500,000 more. Other large payments were made to Illinois, Iowa, Ohio and Pennsylvania, each of which received from \$4,000,000 to \$5,000,000 or more during the year.

A New Two-Piece Piston Ring

ROM the rings used in locomotive piston valve packing rings, which are required to hold a continuous pressure of 200 lb. per sq. in., the Locomotive Appliance Co. has evolved a piston ring for internal-combustion engines for which extraordinary claims are made. The ring is made in two parts, comprising an inner ring with a diagonal cut and an outer ring with a step cut. The two rings are held in such relation to each other that the two cuts are always opposite, so that no path of escape for the gases is formed. The rings are claimed not only to hold the compression but also to prevent oil from working by the piston into the combustion chamber.

Corrugated Lock Washers

NOVEL form of lock washer A has been introduced on the market recently by the Smith & Hemenway Co. As will be seen from the illustration herewith, the washer is of the split type, with its sides corrugated to form points at the ends Smith & Hemenway which dig into the metal of the nut



and of the surface on which it bears. The manufacturers claim absolute security of bolts and nuts locked by this washer.

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Production Tests of Loaded Chassis at the G. M. C. Truck Plant

Ten complete rear wheel dynamometers employed to furnish an accurate check on the performance of all trucks produced by large manufacturer. Aim is to minimize personal error and provide definite data not obtainable in road testing.

O obtain more comprehensive and accurate data on truck chassis performance than would be possible through road tests, the General Motors Truck Co., Pontiac, as announced in these columns several weeks ago, has provided a test room through which all completed chassis must pass. It has been the aim of the company in installing the equipment used in this laboratory to supply practically all of the information that the road test can bring out and, in addition, to minimize personal elements and secure data which cannot possibly be secured with accuracy on the road. The equipment consists of ten complete rear wheel dynamometer stands with all the necessary measuring instruments to obtain a complete commercial, and, if desired on special occasions, a comprehensive laboratory test on a chassis. General Motors engineers state that the equipment has already brought out facts which were not even suspected during the era of road testing. The stands are enabling the company to deliver to the purchaser trucks which are held to a far more rigid standard of performance than would be possible if only road tests were relied upon.

Every truck, before being passed by the chassis test department, must at least come up to the established standard before it is accepted. Trucks which fall short in any of the particulars covered by the test are rejected and sent back to a special department which has in charge the work of putting the chassis in such condition that they will be able to pass the requirements of the test department.

In addition to the check on manufacturing accuracies and roadability, the form used for recording the test data gives an accurate idea of the condition of each truck when it was sent out and is a valuable reference sheet, not only in case of further work on this same truck at a later date, but also in arriving at conclusions made possible by the summation of the data contained in a large number of these reports.

The ten dynamometers are driven by chain, giving a reduction of 3.7 to 1, from the rear wheel drums. The equipment is located in a single row in the two-story 40 by 104 ft. wing which has been added to the machine shop building for this purpose. It will be noted from the accompanying drawing that the dynamometers themselves, the remote control panel and the rheostats are located below the floor on a balcony where the equipment is free from accidental interference, but is accessible, though out of the way of the operators on the testing floor. The rear wheel drums project above the floor.

The dynamometers employed are rated at 50 hp. at speeds of 350 to 950 r.p.m. and are designed to operate on a 230-250 volt D. C. line. At each end of the armature shaft are sprockets which are driven by silent chain from the shaft carrying the 32 in. traction drums upon which rest the rear wheels of the truck under test. With the par-

ticular chain ratio and drum diameter employed the speed of the dynamometer does not exceed 950 r.p.m. Since the dynamometer develops line voltage at 350 r.p.m. the power output of the dynamometer can be pumped back into the service lines which supply the other dynamometers as well as the power required for the factory. By this means the energy output of the engine under test is utilized instead of being dissipated as heat in resistance grids.

When operating at speeds below nine m.p.h. (corresponding to a dyna-

mometer speed of 350 r.p.m.) or at times when the factory load is not heavy enough to utilize the reclaimed power, the energy developed is dissipated in resistance grids which form a part of the electrical equipment. The capacity of these grids is sufficient to absorb for short periods the entire output of the chassis even when the latter is operating in low or reverse gear at speeds as low as $1\frac{1}{2}$ m.p.h.

The dynamometer control consists of three elements—a

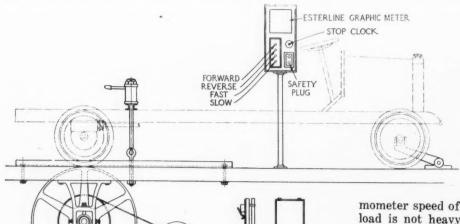


Diagram showing arrangement of the Sprague dynamometer and control panels in relation to the chassis, drum, etc.

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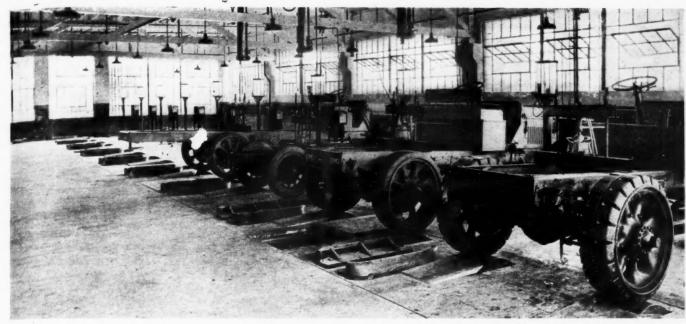
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General view of G. M. C. truck testing equipment, which includes 10 rear wheel dynamometers. The electric dynamometers are geared to the drum shafts and are located on a balcony under the floor

master panel installed adjacent to the driver's seat, a remote panel directly governing the dynamometer and operated by the master panel and an absorption resistance. The last two are located adjacent to the dynamometer itself on the gallery below the floor on which the trucks under test are located.

Upon the master panel are mounted an Esterline curve drawing wattmeter, the chart for which is driven by a clock mechanism, and several push buttons for controlling the dynamometer. The first of these buttons is marked "forward" and is arranged to connect the dynamometer to the line when it is desired to run in the chassis or measure its friction horsepower, when running in a forward direction. A second button is so arranged as to reverse the connections and thereby drive the dynamometer and chassis in a reverse direction.

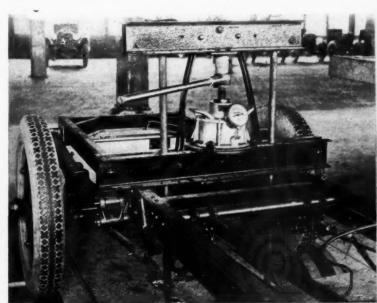
The field rheostat and consequent field voltage is controlled by a small motor which moves the rheostat arm. This motor is controlled by two buttons, one of which is

marked "fast" and the other "slow." Pressing the first of these results in weakening the field and thereby reducing the voltage and the load, while pressing the second increases the field strength, the voltage and the load.

A fifth button marked "stop—brake" disconnects the dynamometer from the line and places across its armature the load resistance referred to above.

The remote panel carries a number of starting and accelerating contactors, reversing contactors and load contactors, as well as the field resistance already referred to. The several contactors are interlocked in such a way as to safeguard the equipment.

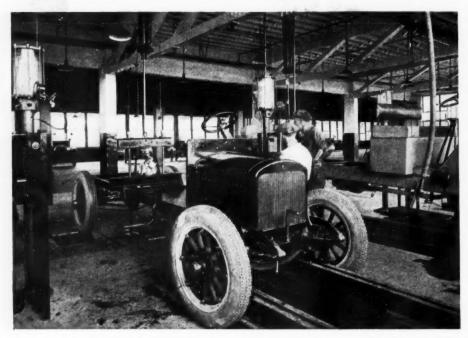
In case of this particular installation, no effort is made to secure a direct measurement of the power output of the chassis. This can be determined only by allowing for the efficiency of the driving chains and the electrical efficiency of the dynamometer acting as a generator. It is the power output of the generator which is measured by the Esterline recording meter. Since the efficiency in question



Black & Decker Loadometer jack used for imposing the desired load, and the gage for measuring this load



Remote control panel, recording instruments, all of which are within easy reach of the operator



View of truck chassis on testing stand, showing support on which front end of truck is anchored during test

is reasonably constant, however, it is possible to determine readily within reasonable commercial limits, whether or not the chassis develops the desired power output under a given set of conditions.

After the chassis are completed in the manufacturing department, they are driven into the test room where the chassis and motor numbers, the tire sizes, gear ratio and data covering the standard and special equipment are noted. All of the chassis are tested under load. This is applied by turning up on the jack which is a part of the Black & Decker Loadometer. This device is equipped with a pressure gage showing the number of pounds applied. Either a normal load or an overload can be applied, but the standard test is conducted under a load condition corresponding to the nominal rating on the truck. The first data secured is the frictional horsepower of the chassis units excepting the engine at several speeds. The engine

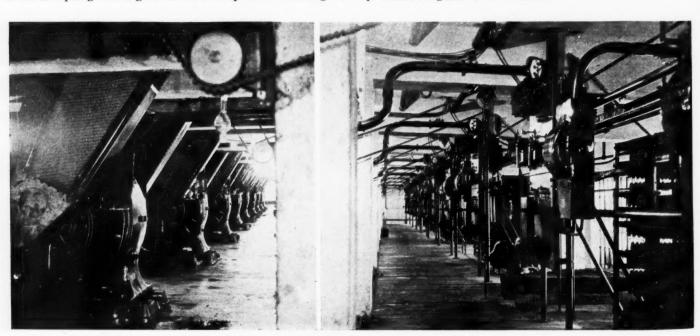
is then thrown in and is driven by the dynamometer acting as a motor and the frictional horsepower of the entire drive including the engine, is secured. Deducting the chassis friction load from the total friction load will, of course, supply information as to the frictional horsepower of the engine.

The engine is then operated under its own power with the gears in high, second and first speeds, during which time the recording wattmeter indicates the power output of the dynamometer at various speeds. The gasoline consumption is also measured and a record is kept of the length of time that the engine was run. To complete the data, the oil temperature in the crankcase, the oil pressure on the gage, the water intake and outlet temperatures and the room temperatures are all noted, together with any remarks which the observer may have to make on this particular chassis. During this run under load, such matters as tappet noises, knock of any kind or any irregularities in the performance similar to those

which would be detected on road tests are noted, and if the chassis falls below standard in any of these, it is rejected until these faults are corrected.

One of the features of the test equipment is the accessibility of all of the controls. Gasoline, air, water, oil and electric controls are all right at the hands of the operator. Exhaust connections are provided so that the exhaust does not pass into the room but into a large, flexible tube which conducts it out of doors. This tube is of such ample diameter that it produces no appreciable back pressure.

The frame used to anchor the front end of the chassis during the test is extremely sturdy in construction. It consists of two channel frame members on each side with a clamping device which securely fastens the front axle in place. The speedometer connections are conveniently located so that speeds are measured by use of the regular speedometer gears of the chassis.



Left, dynamometers on floor below the testing stand and, right, switchboards controlled from the operating panel. Note enclosed chain drive from drums to dynamometer shaft

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Ventilation of Hudson Vehicular Tunnel

Four series of experiments carried out to determine the amount of ventilation required to prevent ill effects on persons using the tunnel, and the most efficient method of ventilation.

XTENSIVE investigations to establish a scientific basis for the design of the ventilating system for the vehicular tunnel under the Hudson River, between New York City and Jersey City, on which work was begun last March, were made at the instigation of the Interstate Tunnel Commission, which has charge of the undertaking. We have already reported one phase of these investigations, that having to do with a determination of the amount of noxious gases contained in the exhaust of internal combustion engines under normal conditions, which was conducted at the Pittsburgh Experiment Station of the Bureau of Mines. The amount of carbon monoxide present in the exhaust was found to be larger than had been anticipated. The engineers of the Bureau of Mines are of the opinion that the average carbureter is set for winter conditions and its adjustment is not changed for the summer, with the result that the mixture is even richer in summer than in winter time, considering only the fuel that is actually vaporized. Moreover, it is believed that, since the temperature in the tunnel will be considerably higher than the outside temperature in winter, the results of the summer tests should be made the basis on which to arrange for the ventilation of the tunnel.

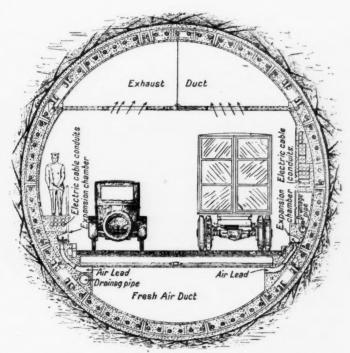
A second series of tests was made at Yale University and related to the physiological effects on human beings of air contaminated with different proportions of carbon monoxide. These tests made it appear permissible to increase the limiting proportion of carbon monoxide in the air from the three parts in 10,000 originally calculated with, to four parts per 10,000.

HOWEVER, even with this reduction in the purity required, the volume of air to be circulated was still greater than that originally estimated, and it became evident that in order to reduce the operating cost of the ventilating system the friction to the flow of air through the ducts and passages must be reduced to a minimum.

A series of experiments was carried out at the Engineering Experiment Station of the University of Illinois to solve, if possible, the following three problems: The determination of the coefficient of friction of air flowing in concrete ducts; the verification of formula used in computing the power required to move air through a duct from which it would be allowed to escape or be drawn off at specified intervals; the establishment of the power losses in bends of flues, ducts and airways. It was found that only about half as much power will be needed to move the required amount of air than would appear from formulas found in hand books, the discrepancy probably being due to the fact that all former experiments were made on a comparatively small scale. In the tunnel the incoming fresh air will reach the roadway from the duct after passing through expansion chambers. This

will straighten out the air flow and effect a wide dispersion of the stream, so that it will not be concentrated at any point either on the roadway or above the floor.

THE final question that demanded solution was whether it was better to introduce the air from the upper or the lower channel, the exhaust being in either case carried off by the remaining channel. Some light on this problem was thrown by experiments made in a special tunnel constructed in the experimental coal mine of the Bureau of Mines at Bruceton, Pa. An elliptical driveway was formed having an axial length of 400 ft., situated 130 ft. below the surface of the ground and 1050 ft. from the entrance to the mine, the section of the tunnel being $7\frac{1}{2}$ by 9 ft. Above the ceiling of this tunnel was an air duct 5 ft. high and below the floor there was another duct 4 ft. high. Either duct could be used for introducing fresh air or withdrawing the contaminated air resulting from the operation of one or more 5-passenger cars within the tunnel. With fresh air fed from a duct below the roadway it was found that the foul air could be carried quicker to an overhead avenue of escape than if the flow was reversed, and by this procedure the noxious gases could be swept away before they had a chance to diffuse and pollute the air in the tunnel.



Sectional view of Hudson vehicular tunnel showing ventilation system



Factory Executives Comment on Hawkins' Views of National Shows

Agreement and disagreement with criticism of national shows expressed in Automotive Industries last week by General Motors executive. Franklin salesmanager supports present show idea.

EXECUTIVES throughout the industry have been invited by AUTOMOTIVE INDUS-

TRIES to comment on the opinions about

national shows expressed in our news columns

last week by Norval Hawkins. Those opinions

industry. The views of automotive executives

in general will be the basis upon which future

interest as being the first frank public state-

ment made by important executives about the

method of conducting the national shows.

Additional letters will be published as they

The question involved is important to the

The symposium presented here is of special

have been supported and opposed.

policies will be determined.

are received.

Editor, AUTOMOTIVE INDUSTRIES:

It would seem to us that Mr. Hawkins' statement in regard to lack of "Tangible returns" on the New York Show could be placed in the same category with remarks of a similar nature we have heard made by the uninitiated in regard to advertising.

Dealing with the New York Show as a local propo-

sition, the interest of the public is well demonstrated by the attendance at the Grand Central Palace which seems to increase yearly.

We are even able to trace some "tangible results" to the sales record of our New York dealership and other dealerships in Metropolitan territory, whose scores in the sales contest which we had under way in January showed New York taking a pronounced lead over dealerships in a similar classification immediately following the close of the show.

It is true that we make little or no attempt to induce dealers to sign up for cars at New York. On the other hand, there are numer-

ous matters to be settled between dealers and factory officials which are taken care of at that time.

It is also the opportunity for association and intermingling during this period, which tends, we believe, to promote a certain amount of esprit de corps in the dealer organization and we venture that the majority of dealers leave New York feeling benefitted by reason of their contact with company officials and the opportunity they have had for an interchange of experiences with fellow dealers.

So far as "cabaret performances," "tables provided with too much food and entertainments none too modest" are concerned, we have never found it necessary to go beyond our usual practice of tendering to the dealers and their salesmen who attend the show, our President's

Luncheon, at which they are given some straight facts concerning what has been done and what is planned, together with a good solid talk by a recognized business authority.

The exhibits at the show itself afford the dealer an opportunity of checking up what the other fellow has and increases his knowledge of what is going on in the automobile world generally.

We do not agree that most buyers are no longer interested in the details of chassis construction. We noticed that those exhibits where stripped chassis were in operation drew and held the largest crowds. If anything, we believe that the present day buyer possesses a greater knowledge of, and exhibits a greater interest in, the principles of motor car construction than ever before.

It may be that the national automobile show suffers because of lack of something with which to compare it, being, as it is, the only thing of its kind in the business world. Look-

ing at it from the standpoint that it is of importance to promote the best interests of the industry as a whole we believe that there is much benefit derived, from the sole fact that at the beginning of the year it serves to concentrate the attention of a large portion of motoring public upon the automobile and kindred topics.

The motoring public within the range of the metropolitan papers cannot fail to sense the prime importance of this exhibition. Correspondents of leading dailies wire their daily story to the papers in all parts of the country. National magazines, both in and out of the automobile field, devote much space to the developments of the New York Show. A widespread interest is created.

We are satisfied that the national show exerts a beneficial influence on the entire industry. This being the



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case, we should next consider what factors make the show successful. Assuming, of course, that every manufacturer brings his best to the Grand Central Palace—his company's local showrooms and some of the hotel lobbies—there would still be little public interest created were it not for the extra editions and space given the show by the newspapers.

From a coldly analytical standpoint, it might be conceded that the advertising of any particular company would be more outstanding and, perhaps, receive more attention if run during some quieter, less competitive period than show time. But if the show is widely beneficial and if the newspapers make the show a success, why should not the manufacturer give his support at this time in the shape of advertising.

The "trumpet of publicity," as referred to by Mr. Hawkins, is blasted widely during show week—and why not? Cold advertising would never create an amount of interest equal to that created by the advertising plus the publicity stores.

Incidentally, what other industry, regardless of the amount of money spent for advertising, is accorded the amount of publicity articles by the newspapers that the automobile industry receives? Furthermore, these articles are read by the public. Otherwise, no newspaper would long continue to afford them space.

In conclusion, we are in favor of the national automobile shows, believing that they are of real benefit to the automobile industry as a whole and feeling that we, as a company, receive a return in proportion to the amount of time and energy expended upon them.

S. E. ACKERMAN, Sales Manager, Franklin Automobile Co.

Show Value Small, Ricker Says

Editor, AUTOMOTIVE INDUSTRIES:

Norval Hawkins makes a very logical case of the show expense, and I think is thoroughly justified in his contention as long as motor cars are built as though they all came out of the same mill. Except for a few individual refinements, cars of a price class seem to offer very little that is particularly individual save in the lines of body and color schemes and size.

The show is the clearing house for new ideas. In past years it was the place where the announcements of the newest developments in the industry were made, and the trade usually looked forward to the New York Show, not only as a place of business, but a place to find out what the leading developments of the year would be.

If the industry is ever in a position again where rapid development along new lines takes place, then I think the shows will again accomplish what they have done in the past—namely, to educate a large portion of the public in regard to the new ideas and developments made during the previous year and now available for consumption.

In the days when the eight-cylinder Cadillac and the Twin Six Packard were first brought out, public interest was so keen in regard to these new developments that I seriously doubt if it would have been advisable at that time and under those circumstances to have even considered the prospect of eliminating shows. Where a lot of original development work is exhibited, as at this year's salon, you will find that the show not only accomplishes its purpose as a business proposition, but is of inestimable benefit to the entire industry, because it is utilized by both the sales, manufacturing and engineering departments as a school in which to study what is

going on in the industry and what the best minds have brought out. In other words, it forms a composite picture of the state of the automotive art at the particular time that it is held; viz., the number of executives from the big western production factories in attendance at the salon in December this year was notable and indicative of the interest shown at such an exhibition.

So long as cars are sold on a pound basis in large quantities a show is apparently valueless, because the product is so widely distributed that a show is absolutely unnecessary. It is for this reason that I so thoroughly agree with Mr. Hawkins, because economically it offers nothing to the manufacturer and adds an unnecessary and almost unjustified expense to the cost of the cars which could be far better spent in another direction, such as improving the quality of the car or helping to merchandise it in greater quantities and thereby reduce the cost.

CHESTER S. RICKER,
General Manager,
Duesenberg Automobile & Motors Co., Inc.

Agrees With Hawkins in Many Ways

Editor, AUTOMOTIVE INDUSTRIES:

Although I do not want to in any way appear to be critical of the very splendid work which has been done in connection with the National Automobile Shows by our good friend, Sam Miles, I am inclined to agree with Mr. Hawkins in many ways.

It is my personal opinion that too much advertising at the time of the National Automobile Shows is done for the benefit of one's competitors, so to speak—that the amount of retail business done is hardly commensurate with the expense of the campaigns launched at the time of the shows.

It is my opinion, however, if the automobile shows could be made more or less a "trade conference" rather than a public display, such might be more helpful than the present type of show.

It is certain, however, that the public is given a splendid opportunity to see the automobile industry in its composite through the medium of automobile shows. But I am of the opinion that a divorcement of the rather general features and those of intensive interest to the trade would strengthen the effect of the shows from the standpoint of the manufacturer in accomplishing at the automobile shows what he originally set out to do, i.e. to present his product to the trade and to get in some master strokes in the enlargement of his selling organization.

H. R. HYMAN, Advertising Manager, Stutz Motor Car Co. of America, Inc.

Commends Criticisms

Editor, AUTOMOTIVE INDUSTRIES:

Not only have I read the article by Norval Hawkins inclosed with yours of the 19th, but I asked our president, Mr. George M. Dickson, to also read it. He joins me in saying "This is my viewpoint exactly."

If I were to enlarge and write you a ten-page letter I do not believe I could express any better, that in my opinion Mr. Hawkins has shown in his statement the only direct benefit derived from the expensive automobile shows is a certain stimulation of interest which could easily be accomplished at much less expense and along sounder business lines. With kind regards to

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beneng the yourself and my friends Swetland, Beecroft, Louis Smith and others in your organization too numerous to mention.

HARRY UNWIN, National Sales Manager, National Motor Car & Vehicle Corp.

Benefits and Expenditures

Editor, AUTOMOTIVE INDUSTRIES:

Replying to yours of the 19th inst. desire to state that in our opinion we agree with you that the automobile show as a whole entails a great deal of unnecessary expenditure, which could be put to better advantage if applied to improving the car or other general sales plans, rather than having the dealers come to New York, treating them to expensive dinners, etc.

Of course it has its advantages as well, for instance, the public is enabled to see various types and makes of cars at the same time and thus get a better idea of what is on the market, but we do not think that the volume of business obtained through the show is sufficient to at least balance the amount of expenditures.

OSCAR SPERLING, President, Associated Motors Corp.

Jordan Favors National Shows

Editor, AUTOMOTIVE INDUSTRIES:

I think Mr. Hawkins is talking frankly, but loosely. Just as long as you can get a few hundred thousand people in this country to pay fifty cents to look at an automobile, you can depend upon it that you are doing

something to maintain interest in the greatest business in the world.

The automobile shows should be continued by all means, until it is impossible to get anybody to go and visit them.

EDWARD S. JORDAN,

President, Jordan Motor Car Company.

Minimum Value

Editor, AUTOMOTIVE INDUSTRIES:

Our ideas about national shows coincide with Mr. Hawkins'. It is because we viewed the matter in the same light that we are not represented at the National Shows this year.

R. T. JENKS,

Sales and Service Manager for Receivers, Stevens Duryea, Inc.

Fixed Social Events

Editor. AUTOMOTIVE INDUSTRIES:

In the main I agree with Mr. Hawkins about the intrinsic value of automobile shows, but our opinions will not have any effect on future exhibits, for the annual automobile show has become a fixed event in the social calendar. The annual truck show is just as instructive mechanically but it draws only business heads. It is not a social event.

Women, after all, buy the pleasure cars of the nation, and a woman loves the surroundings of luxury. No small car owner ever lived who did not dream of some day owning a big limousine. Women go to the automobile shows prepared to revel in their dreams, and as they usually win when they go after anything, the future show will be patronized and continued, though their dreams may not come true.

As to the waste and the blur and the extravagance, Mr. Hawkins is quite correct. I don't believe the advertis-

ing in the New York papers at show time delivers many customers. The impression it created depended entirely on the quality of the advertising. The diamonds and the pearls of the business do not need the advertising and the rhinestones—or is it Ruhrstones now—did.

Of course, Chicago is the natural place for an exhibit such as Mr. Hawkins suggests. Eliminate the Ford from the scene and Detroit is not the automobile center. In fact, like the center of population it is moving westward and is now at Elgin, Ill., the home of the American Steamer.

A. T. MACDONALD,

The American Steamer.

Rickenbacker's Comments

Editor, AUTOMOTIVE INDUSTRIES:

Mr. Norval Hawkins' statement expressing his belief that the National Automobile Shows are not worth to the manufacturers what they cost them, is one, I may state, that is not worthy of serious thought before answering. Since time immemorial the success of industry and personality has depended first, on its service to humanity, and secondly, on the method in which it is presented to the public at large.

To say that the National Shows are not worth their cost might be compared with stating that the New York Show editions, setting forth the merits of all automobiles, do not contribute in any way, shape or form to the buy-

ing power of motor cars.

Further, it seems unfair for Mr. Hawkins, a man of his knowledge and ability, to criticize what has become known to the motoring public of the world and the industry itself, the leading medium of exploitation of our wares. The success of any commodity or product, regardless of its value, depends on how many people are able to see it and learn to believe in its merit.

E. V. RICKENBACKER, Rickenbacker Motor Co., Detroit.

Radiator Nomenclature

Editor, AUTOMOTIVE INDUSTRIES:

I indorse cordially every point brought out in the article on Radiator Nomenclature (Automotive Industries, Nov. 16, 1922, p. 971). While you are at liberty to quote this as my personal opinion on the subject, please bear in mind that it is not an official commitment of the Bureau. However, the Bureau would surely indorse the general proposition of a need of standardization of terminology in radiator descriptions, for the lack of uniformity of nomenclature today cannot be disputed.

Although the Bureau might hesitate without a more extended consideration to lend its indorsement to the particular standardization scheme you outlined, I consider it good and can think of no suggestions to offer for its

improvement.

It may interest you to note the attitude we displayed in our recent booklet on "Aircraft Radiators" regarding the classification terms "cellular," "honeycombs," etc. We employed such terms in tables or properties where it really made little difference whether or not the reader could visualize the type of core correctly except in a most general way; but in all those tables where it is was important to show just what type of core was meant, it was necessary to make a sketch, and then we did not deem classification terms of the kind mentioned as being definite enough to be worthy of inclusion in the headings.

D. R. HARPER, 3D, Physicist, Bureau of Standards.

Type K-4 Continental Truck Engine Goes Into Production

Has a detachable cylinder head and full pressure lubrication. Gives 35 hp. at 1300 r.p.m., at which speed it is intended to be governed. Weight is 680 pounds as furnished.

FOUR-CYLINDER truck engine known as Type K-4, shown by the Continental Motors Corp., has recently been put into production. Although this engine was developed quite some time ago, it has not been extensively built until now. It is of 4½-in. bore by 5½-in. stroke and therefore has a piston displacement of 281 cu. in. It is a three-bearing, detachable head engine with lubrication of the full-pressure type. The power output is 21.5 hp. at 650 r.p.m., 30.5 hp. at 1000 r.p.m. and 35 hp. at 1300 r.p.m., the recommended governed speed, while at 1500 r.p.m. the output is 36.5 hp. The weight of the engine as furnished is 680 lb.

The four cylinders are block-cast, and exceptional uniformity in the thickness of cylinder and jacket walls is claimed to result from the use of automatic molding machines. Cooling water completely surrounds each cylinder, valve seat and valve stem. Each cylinder block is subjected to four water pressure tests in the course of its manufacture. The separate cylinder head is held to the cylinder block by means of eighteen studs, with a copper-asbestos gasket between. Four lifting lugs simplify the removal of the head. The tops of the combustion chambers are reinforced to withstand the explosion pressures.

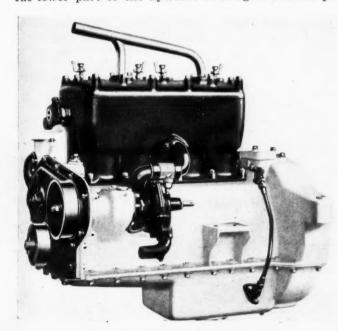
The crankcase is cast of aluminum alloy, the upper part of the flywheel housing being cast integral with it. The lower part of the flywheel housing is made a part of the aluminum alloy oil pan. As in other Continental engines, the crankcase of the Model K-4 is designed along the lines of a bridge truss, so as to give the most rigid support possible to the crankshaft bearings. In the machining of the crankcase, drilling and tapping operations on all four sides are completed in one stroke. The main oil passage, which extends the whole length of the crankcase, is cast-in and is lined with steel to obviate trouble from porous castings. The auxiliary oil passages from this main gallery to the crankshaft main bearings are also cast in the case and lined with steel. The crankcase bolting flange is extended to accommodate side pans between the engine and the side members of the frame. The oil pan contains the gear type oil pump and the oil screens, both of which are accessible without disturbing the pan. This part is so designed as to give exceptional clearance over the front axle.

Automatic Valve in Breather

The breather has an automatic valve and is located on top of the crankcase just back of the cylinder block. The automatic valve is intended to prevent foreign matter from getting into the crankcase.

In the manufacture of the engine, not only are the sets of reciprocating parts for each cylinder checked against those for the other cylinders, but each individual part is checked as to weight. There is no center hole in the piston head to form a starting point for a deposit of carbon, and the circumference of the piston is finished by grinding. The pistons are 5 7/16 in. long and are provided with four rings of the one-piece type with diagonal split. The piston pin is of the usual hollow, case hardened type; it is fixed in the piston bosses, and its bearing in the upper, bronze-bushed end of the connecting rod is 11/4 in. in diameter and 11/8 in. long. All main bearings of the crankshaft are 21/4 in. in diameter, and the lengths are as follows: Front, 25% in.; center, 2¾ in.; rear, 2¾ in. The crankpin bearings are 2½ in. in diameter by 23% in. in length.

The flywheel is cast of high tensile cast iron (semisteel). This permits of cutting the teeth for the starter gear directly in the flywheel rim. The camshaft also is supported in three bearings, of such diameters relative to one another that the complete shaft can be withdrawn from the front of the engine after the gearcase cover has been removed. The diameters and lengths of the three bearings (front to rear) are as follows: 2 5/16 by 2 1/16; 2 9/32 by 1½; 2 7/32 by 1¼ in. A spring thrust which can be adjusted from the front of the gearcase cover holds the camshaft in its correct operating position. The camshaft driving gear bolts directly to the shaft.



Type K-4 Continental truck engine

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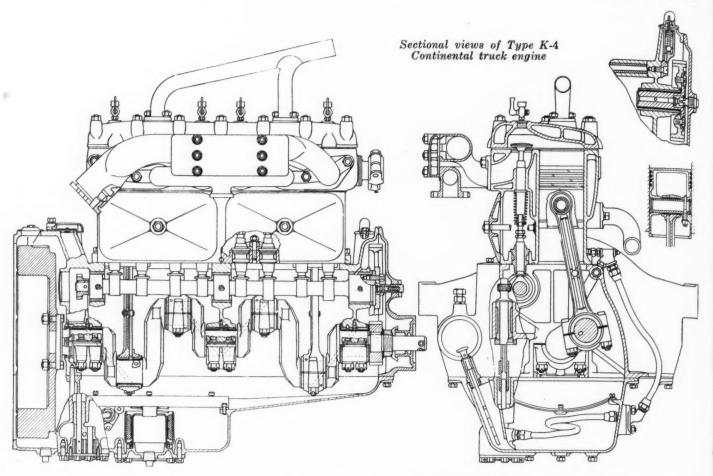
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All of the bearings on the crankshaft are of bronze, with a white metal facing, and are positively held in position by means of bronze screws. The shims inserted between the bearings and their caps for adjustment purposes also serve to hold the bushings in place. Each camshaft bearing is a single piece of white metal alloy, while the piston pin bearings are made of bronze and pressed into the upper ends of the connecting rods. The other bearings on the engine, including the two on the water pump shaft and the two on the idler shaft, are of the bronze back, white metal type.

The valves are of the usual type and are operated by mushroom type cam followers with screw adjustment. They have a clear diameter of 1% in. and 7/16 in. stems. Two cover plates protect the valve mechanism and retain the mist of oil in which it operates. The camshaft is driven through all metal gears, and provision is made in the gearcase cover for taking up the end thrust due to the helical teeth of the gears. The idler gear is permanently fixed to its shaft which later rotates in two bushings held in the crankcase.

Inlet and exhaust manifolds are made in a single casting with a hot spot at the center to aid in the vaporization of the heavy ends of the fuel. An adjustment is provided to take care of the difference in the amount of heat required in winter and summer respectively.

Lubrication is by the full pressure system. The aluminum oil pan, bolted to the crankcase, contains the oil screens and the oil pump, which latter is driven from the camshaft through a pair of helical gears. Two gallons of lubricating oil are required to fill the system. The oil supply in the crankcase can be checked by means of a gage of the bayonet type. The oil filler is on the gearcase cover and is both large and accessible. Oil pressures will vary from 10 to 25 lb. per sq. in., depending upon engine speed, viscosity of the oil, etc. A pressure

relief valve is provided on the oiling system, and the pressure at which this opens can be adjusted by means of a screw at the top of the gearcase cover. Camshaft bearings, cylinder walls and valve mechanism are lubricated by the oil thrown off from the connecting rods. An extra lead takes care of the timing gears and another of the oil pump and governor drive gears.

The water pump and its drive are worked out along the same lines as in other Continental models. An adjustable fan bracket is provided. The fan is driven through a flat belt from a pulley mounted on the forward end of the pump shaft. The K-4 engine is designed for three-point support in the chassis frame. Two supporting arms are cast integral with the crankcase, and are intended to be bolted to brackets secured directly to the main frame of the vehicle, while the third point of support is a 5-in. diameter bearing cast integral with the gearcase cover.

As regards accessories, the engine is designed for a vertical outlet, $1\frac{1}{4}$ -in. carbureter and accommodates a governor of any standard make. Provision is made for both magneto and battery ignition. The crankcase accommodates any standard make of lighting generator having a No. 2 S. A. E. bolting flange, and the flywheel housing any standard make of starting motor designed for S. A. E. sleeve type mounting $3\frac{1}{2}$ in. in diameter. The flywheel housing flange is a No. 2 S. A. E. standard.

With the placing in production of the Type K-4 the Continental Motors Corp. now has a complete line of truck engines all of the same general design. They are: Model J-4, 3¾ by 5 in., 221 cu. in. displacement, for 1 and 1½-ton trucks; Model K-4, 4½ by 5¼ in., 281 cu. in. displacement, for 2 and 2½-ton trucks; Model L-4, 4½ by 5½ in., 350 cu. in. displacement, for 3 and 3½-ton trucks; Model B-5, 4¾ by 6 in., 425 cu. in. displacement, for 5-ton and larger trucks.

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Motor Vehicle Entering Utility Stage in Spanish Market

Small town and village market broadening. System of land tenure and poor roads have retarded sales. Sound export policies and study of market will win firm place for American cars and trucks.

THE automobile in Spain is approaching a point of transition in the minds of the people. It is ceasing to be a luxury vehicle for the upper classes and is becoming a utility for the general public. The fact is evidenced by the broadening small town and village market for Fords, a movement which has only gained headway recently. No doubt price reduction has greatly influenced this wider distributon.

Heretofore, the use of motor vehicles has been confined largely to the big cities and their environs, for touring has been curtailed by the deplorable condition of the highways. The price of gasoline, which approximates 50 cents a gallon, is another factor which has retarded a more general use of the motor vehicle, particularly its adoption by the general public.

Country of Large Land Holdings

Spain is a country of large agricultural land holdings. The majority of land owners do not cultivate their own land but lease it to small-town farmers who have extremely limited purchasing ability. The wealthy land owners generally live in Madrid or other large cities and purchase the most expensive cars to be had. The situation is nearly parallel to that of the large land owner in Argentina who lives in Buenos Aires and has his land cultivated by transient tenant farmers.

There is a very limited manufacture of motor vehicles, most of which is centered in the city of Barcelona. The annual output totals a few thousand machines. Ford assembles 30 cars a day at his Cadiz plant. The four Hispano-Suiza is manufactured in Barcelona at the rate of some 400 cars a year and the Elizalde, made in four and eight-cylinder models, is turned out in small quantities in that same city. The Victoria, a small, high-grade machine, which takes its name from the Queen of Spain, and the Landa and Espana, both of local character, all are produced in very limited numbers.

Spain imports most of her motor vehicles and at the present time the United States is furnishing the largest amount, with France second and Fiat of Italy third. The German cars have not come up to expectations and their importation has fallen off materially. The body design is considered below the general standard.

Motor vehicle dealers in Spain are generally fine types of business men. They have a reputation for honesty and too frequently one hears complaints about the treatment these dealers have received from some of the American manufacturers inexperienced in the export business. Some of the troubles which the dealers have to contend with are from cars not arriving on schedule, price reductions without due allowance, cars furnished in colors other than ordered and high prices for parts.

These troubles are not experienced by the representatives of the well-established manufacturers who have improved their export technique and have a most creditable reputation for sound and honest business policies with their dealers.

The Spanish automobile dealer desires credit extensions which will permit having the cars on the salesroom floor before having to meet the drafts. This credit arrangement is in effect with many European manufacturers.

European cars still dominate the high-priced car field. Rolls Royce, Panhard and Voisin occupy the strongest position. Panhard, Renault and Fiat maintain branch organizations in Madrid. Spaniards like well-made fashionable bodies. This fact is illustrated by the number of Fords in use which are fitted with highly finished limousine bodies representing an expenditure many times greater than that of the chassis.

Motor bus development not only for city use but for intercity work is a promising movement for the industry. Recently the Vickers interests in England placed 150 Tilling-Stevens buses in Madrid and 100 in Barcelona. These fleets will soon be supplemented by smaller ones in other localities.

With the exception of the larger fleets, buses of a miscellaneous character are in use. Most of them are left-over war chassis with a variety of bodies. The scarcity of railways in Spain is sure to lend impetus to the extension of motor bus service and also to expanding the use of motor trucks for transporting merchandise.

Great Road Building Problem

Spain, with a population of 22,000,000, the majority of which is rural, has a great road building problem ahead. The present condition of her highways is inexcusable. Once outside of the cities the highways are native trails with the exception of a few places where the road building movement is started by piling pressed rock and covering it with a mixture of sand and clay. With such highways it is not surprising that 75 per cent of the automobiles are located in the cities, Madrid having 10,000, Barcelona 10,000 and Seville 4000.

The Spanish roads are of great width, which makes the problem of construction proportionately difficult. The roads from Madrid to Granada, 300 miles away, may be described as bad. From Madrid to Barcelona, 400 miles away, the first 150 miles are good and the remainder literally mud. From Madrid to San Sebastian, 300 miles, the highway is in fair condition. One of the finest bits of highway in the country is found on the road from Madrid to Seville, where an elevation of 4000 ft. is reached crossing the mountains.

Machining Differential Housings on a Production Basis

Large number of dimensions with close tolerances make difficult job. Practical methods are outlined. Mating dimensions of case and cover are cut with tools which operate simultaneously.

By H. A. Loudon and H. S. Beal Jones & Lamson Machine Company

T is today recognized that the designer of a mechanism which is to be manufactured must be equally as familiar with machining methods as with the strictly functional requirements of his design.

The differential case of an automobile rear axle may be said to be an example of pieces whose characteristics and dimensions are determined only by the functional requirements of the original design. The machine shop has had to accept this piece and make it to the close dimensions required, with as much speed as the nature of the work would permit

The single piece differential case (two pinion differential) is a revision of design aiming at greater economy in machining. While this type of case has been accepted by some of the manufacturers of lighter cars, the two-piece case has been retained by many.

It has become axiomatic that the expense of producing a single piece increases greatly in proportion as the number of dimensions which must be held to close limits is increased. Again, the greater the number of sizes that have to be held to a close limit of relationship with one another, the greater becomes the difficulty and expense of machining them.

Considering first the two-piece case, we will outline

the problem with which the production department is confronted. The requirements, of course, differ according to whether the axle is full floating, semi-floating or of some other type. In order to cover all cases, we will take the most difficult example possible (Fig. 1).

Starting from the center line XX', we will assume that the distances to the surfaces noted should be held to a tolerance of 0.002 in.

EE', the spherical seat for the differential pinion;

GG', the thrust bearing for the side gear;

HH', the bearing seat for the side gear;

D, the seat for the ring gear;

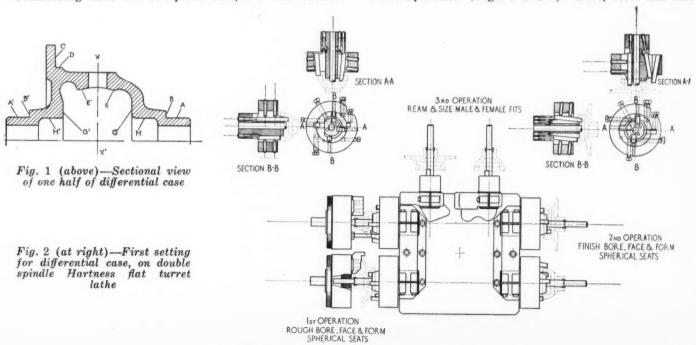
C, the locating shoulder for the ring gear;

BB', the shoulders for locating the ball bearings;

AA', the seats for the ball bearings.

When we consider that in this, the most difficult case, five of the dimensions must be held to within 0.002 in. and seven must be held within 0.002 in. in their interrelationship, we appreciate the difficulties the piece involves for the production engineer, and what opportunities in the way of simplification of design it offers to the designing engineer. We submit the following methods of machining for consideration.

First Operation (Figs. 2 and 3)-Bore, form and face



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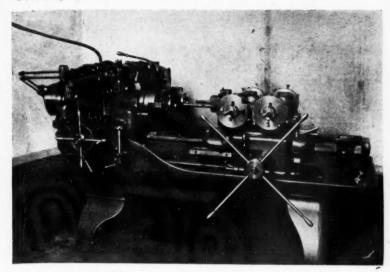


Fig. 3—Machining differential case on double spindle Hartness flat turret lathe



Fig. 5—Showing operations in Fay automatic lathe

the inside on a double spindle Hartness Flat Turret lathe. The double spindle Hartness Flat Turret lathe is tooled to finish both the cover and the case on the inside at the first setting. On the front spindle the case is gripped on the outside diameter of the flange, while on the rear spindle the cover is gripped by the hub, the large diameter being supported by a ring secured to the face of the chuck.

The turret carries tools for finishing the inside complete, as well as the faces of the joint between the cover and case. The operations are:

1st—Rough inside complete and face, using form tools. 2nd—Bore, counterbore, form spherical seat and finish face.

3rd—Finish-bore male and female fits and ream the hole.

The production on the operation shown is 36-40 pieces or 18-20 complete cases per hour.

Note in Fig. 3 that all cutter heads are piloted in bushings which are held in chucks, so that the cutting tools are very rigidly supported.

There is considerable advantage in the fact that the mating dimensions of the case and cover are cut with tools operating simultaneously. The result is that these two sizes vary proportionately, within the tolerance al-

lowed, and so mate more closely than they probably would were they machined independently to the same tolerances. This is very important also for the reason that it enables them to go down the whole production line together.

There is another advantage in handling these parts in pairs. In small shops, where production is not large, handling in this manner saves re-tooling a machine for either case or cover. It keeps the machine in continuous production.

Second Operation-Drill bolt holes.

Third Operation—Rough and finish turn all of the outside of both halves of the complete differential case on Fay automatic lathes, both halves of the case, fastened together, being held on specially constructed arbors. The particular design of the arbor would depend upon the peculiarities of the housing to be machined.

In the first case, Fig. 4, the housing is assembled before the arbor is inserted. The arbor is then slipped through one end, and the locating and driving key is inserted through a cored hole in one-half of the case, the nut on the end of the arbor locking the key and arbor in place. The work is thus located from the thrust surface for one of the side gears.

Fig. 6 illustrates a type of arbor so made that the housing is assembled on the arbor. The arbor locates

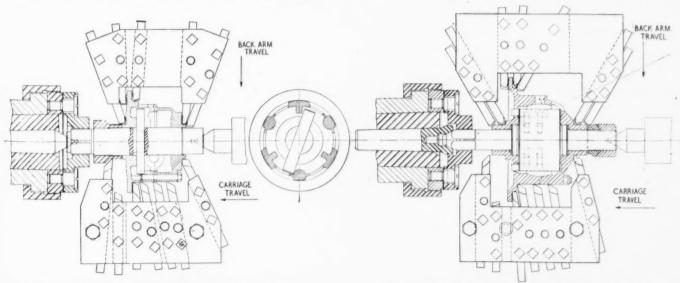


Fig. 4—Rough turning differential case on Fay automatic lathe

Fig. 6—Rough turning differential case in Fay automatic lathe

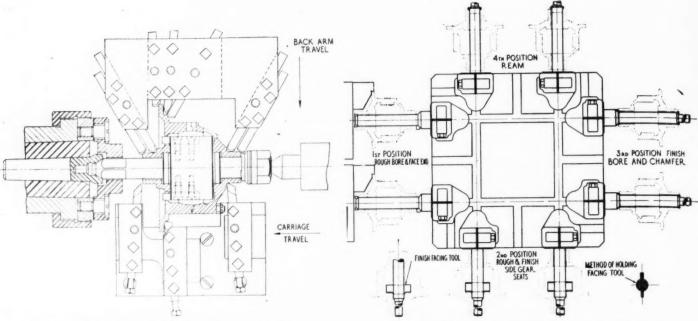


Fig. 7—Finish-turning differential case on Fay

Fig. 8—Tooling for inside cuts on single piece case, on double spindle Hartness flat turret lathe

against the thrust surface for one of the side gears which was finished in the double spindle turret lathe. In each case, however, one end of the arbor is squared to engage the special drive plate on the spindle.

Figs. 5, 6 and 7 illustrate the same case shown in Figs. 2 and 3 on the double spindle Hartness Flat Turret lathe. Two Fay lathes are used in this operation, one being a roughing and the other a finishing machine. The first lathe, which roughs this piece, operates as follows:

The carriage rocks in, then turns as shown by the arrow in Fig. 6, turning the ball bearing seats, the outside of the barrel of the case (note that the cut is divided between three tools), the ring gear seat, and the outside of the flange.

The back arm faces down the ball race shoulders on both sides of the ring gear flange, chamfers the ball race seats and the ring gear seats. The tooling of the finishing machine, Fig. 7, is identical with that of the roughing machine, with the exception that the turning of the barrel and the outside of the ring gear flange is omitted.

Each of the three tools on the carriage for this finishing operation is held in an individual tool block, to facilitate independent adjustment, as each of the three diameters turned must be held inside of a tolerance of 0.002 in.

The output of a pair of Fay automatic lathes on this operation on the particular case shown is forty complete cases per hour, which in the case of a two-piece housing means forty covers and forty cases.

Fourth Operation—Drill holes in flange for ring gear bolts and in body for spider arm.

Fifth Operation-Assemble.

The method of machining a single piece case is similar to that of machining the two-piece case. The inside cuts are taken on the double spindle Hartness Flat Turret lathe, as shown in Fig. 8. The case is then placed on an arbor and finished on the Fay automatic lathe. The tooling for this operation is shown in Fig. 9. In this instance the case is located from the hole on the arbor, being held in position by means of a wedge bearing against the bosses which take the thrust of the side gears.

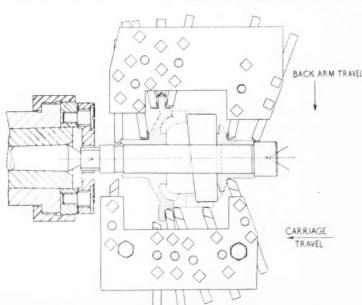


Fig. 9—Rough turning single piece differential case on Fay automatic lathe

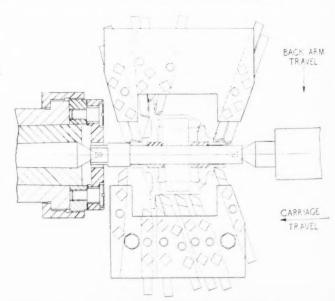


Fig. 10—An alternate method of mounting a single piece differential case on Fay automatic lathe

An alternate method of mounting a single piece case on the Fay is shown in Fig. 10. The case is located on the bearing for the hub of the side gears by means of the loose bushing indicated, the key of the arbor clearing the hole in the end of the case. A wedge is driven through the arbor, holding the case in place and also acting as a driver.

As stated at the beginning, the problem of machining pieces in which so many dimensions and inter-relationships must be held to close tolerances, challenges the ingenuity of the tooling engineer. We believe that the method outlined accomplishes the desired results in a comparatively simple way, and at the same time gives a very high rate of production.

The inside dimensions are all secured very accurately in a single chucking on the double spindle Hartness Flat Turret lathe with the maximum of multiple tooling. Machining the inside surfaces in the first operation, then locating from these surfaces on an arbor, and finishing the case in the second operation assures not only correct inter-relationship of dimensions, but also concentricity. The high production is secured on the double spindle lathe because two pieces are machined in practically the time taken to machine one on a single spindle machine. A high production is secured on the Fay lathe because one operator runs two machines, and because multiple tools, all cutting at the same time, finish both halves of the case at once, in the time of the longest single cut.

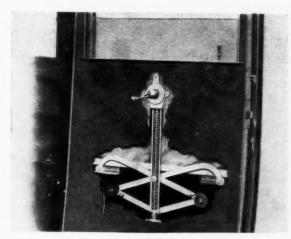
New Mechanical Window Regulator

A MECHANICAL window regulator known as the Common Sense is being placed on the market. A cut-away view of the regulator is shown herewith. The following statements concerning the device are made by the manufacturers.

The glass can be put in place either before or after the job is painted and trimmed. No lefts and rights are used. The window is counterbalanced and operates smoothly both up and down, the spindle revolving on ball bearings. It is a single-unit assembly requiring only a small cutout in the lock board and is attached with five screws. It locks automatically at any desired point. Inclusive of the inside handle the weight is less than 4 lb., but the arms are sufficiently strong to hold more than 175 lb. and lift any size glass. Installation cost is said to be lower than for many other types.

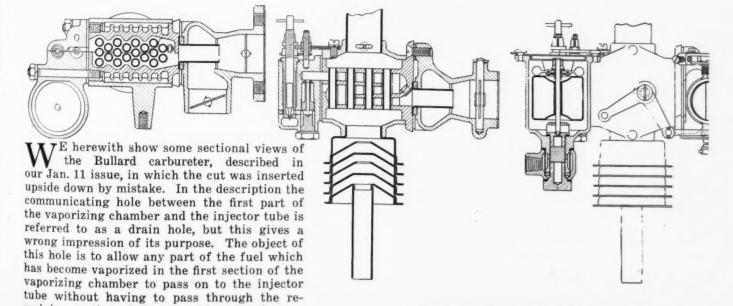
The Ackerman-Blaesser-Fezzey Co. has been organized in Detroit to manufacture the regulator.

maining section of the vaporizing chamber.



Common Sense window regulator

The Bullard Carbureter



Sectional views of new type Bullard carbureter

American Strength in Belgian Market Indicated at Brussels Show

Local makers handicapped by tariffs. Agents for American cars capable. S.A.V.A. brings out new four-cylinder car. Other new jobs include Metallurgique overhead valve model, a new eight made by Dunamis, a 122 cu. in. Minerva, and a 2-ton Fiat truck.

By W. F. Bradley

BRUSSELS, Jan. 16.

RANCE, America, Belgium, Italy and England are represented in the sixteenth Belgian automobile show, which was opened in this city Saturday by Burgomaster Max, and was visited by the King yesterday. The Belgian show is the most widely international in Europe, but coming at the end of the season it does not provide a great wealth of mechanical novelty. Of the 71 firms exhibiting in the passenger car section (body makers excluded) 34 are French, 16 American, 12 Belgian, 7 Italian and 2 English. These figures reveal the extent to which foreign makers are operating on the Belgian market. The home makers are feeling American and French competition most severely; most of the Italian competition comes from Fiat, for the other firms do only a very small volume of business. English competition in Belgium is practically non-existent.

A 20 per cent ad valorem import duty exists in Belgium, and under this dealers in French and Italian cars are able to import advantageously, the French having a handicap of only 8 per cent in the matter of exchange values and the Italians having a slight advantage.

American dealers are handicapped by exchange rates, but despite this American cars have secured a strong position on the Belgian market since the Armistice. This can be attributed to the fact that America was the only nation capable of delivering with a reasonable amount of delay, that these cars were of the cheap, general utility type which had never been built by Belgian makers, and also that there was really good commercial management behind the dealers' organizations.

Some Belgian Firms Hard Hit

The period since early 1919 has not been all smooth sailing for dealers in Belgium. Delays in getting deliveries hit some of the weaker firms very badly and drove some of them out of business. The methods adopted by some who got into the business when demand was bigger than supply, were not of the best, and when business had to be conducted on competitive lines they were forced to the wall.

Some of the best men in the Belgian retailing business are now handling American cars and by their efforts have succeeded in securing a strong position for American products. The biggest individual seller is the Ford, handled by the P. Plasman Company; Buick has a very strong position, and other makes prominent on this

market and in the show are Cadillac, Lincoln, Packard, Paige, Studebaker, Hudson, Essex, Willys-Overland.

Whereas in 1921 France led with imports into Belgium, America being a very poor second, last year the leading position had been taken by the United States, so far as the number of automobiles is concerned, with France second. On a value basis, however, France had a lead on America of approximately 6,000,000 francs, for the average price of the French cars was higher than that of American products.

French Cars Prominent

Citroen, although he only got into business as a car manufacturer after the war, is doing a greater volume of business on the Belgian market than any other French maker. Renault, Peugeot and Berliet doubtless follow in order of importance. Fiat does as much business as all the other Italian firms combined, the greatest volume of sales being with the 10 hp. four-passenger model. Although German cars are not admitted to the show, some activity is being shown by German firms in Belgium. Generally, however, the German is losing position on this market. Owing to unfavorable conditions the Benz organization recently closed down. Austro-Daimler is showing activity in Belgium.

A lot of discussion is being heard at the present time on the question of import duties, and there is an official move to abandon the present 20 per cent import tariff for a new one on a weight basis which will raise duties considerably. The undercurrent seems to be rather in favor of a campaign to lower tariffs in neighboring nations rather than to increase the Belgian tariff. There is a certain amount of irritation against the French, who maintain a 45 per cent duty against all foreign cars, irrespective of origin and enter Belgium on a 20 per cent basis. There is every reason to believe that in urging the Government to raise the Belgian tariff on automobiles, the real desire is to force the French to lower their 45 per cent tariff. It is pointed out that the French have always justified their 45 per cent tariff on the ground that a similar tariff existed in America. Now that the United States has dropped to 25 per cent the French endeavor to side-step the question.

Several of the leading Belgian makers declared that they were not afraid of either American or French competition on their market, but they did want a square deal. Minerva, the biggest maker in Belgium, is interested in ries 23

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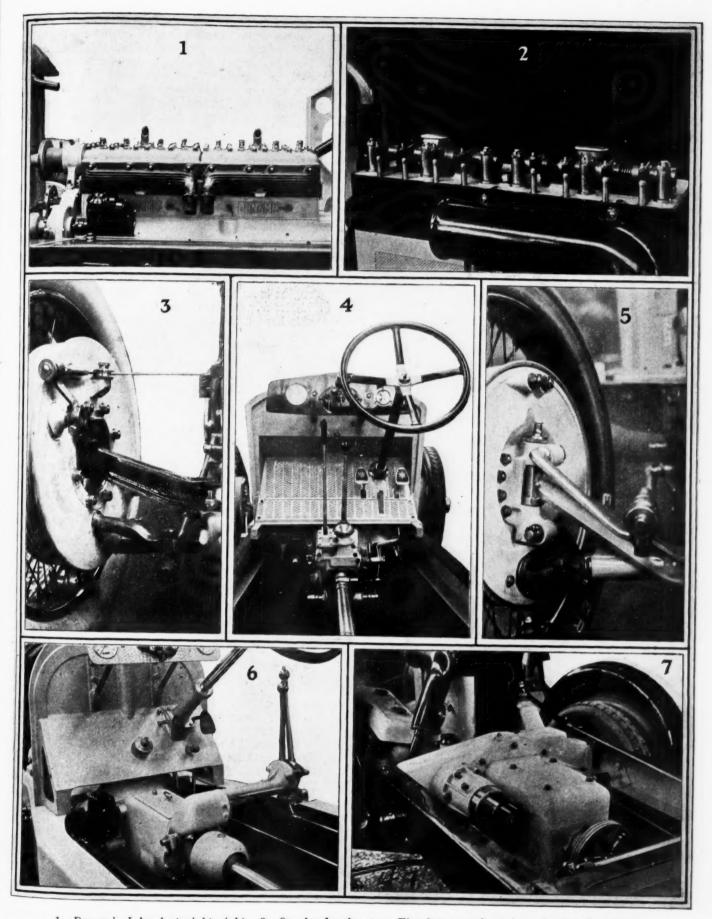
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1—Dunamis L-head straight eight. 2—Overhead valve gear Fiat 2-ton truck engine. 3—Detail of front wheel brake on Dunamis straight eight. 4—Metallurgique 122-in. car. 5—Detail front wheel brake new 122-in. Metallurgique. 6—Sava gearbox, aluminum dash and toe board. 7—Clutch housing, gearbox, starter and fabric universal, Fiat 2-ton truck

the American market on the 25 per cent basis, and its directors see no necessity for raising the tariff against American cars. Excelsior is preparing to market its high-grade six in the United States and would prefer to see Belgian tariffs stand as they are. The manager of an important firm laying down the production program for a new model stated that if the French duty was lowered he would build 750 cars during the year; if the Belgian duty was increased he would still produce 750 cars; if there was no change he would have to cut his production.

New S. A. V. A.

Few new cars are to be seen at the Brussels show. S. A. V. A., an Antwerp firm which had its factory stripped bare by the German army, has only just got into production again and is showing for the first time a 122-cu. in. four-cylinder car which is one of the smartest engineers' jobs in the exhibition. The engine is a four-cylinder detachable head overhead valve type with concealed pushrods, tubular rods, aluminum pistons, three-bearing shaft and silent chain front end drive. The Bosch combined generator and distributor, which is used for ignition, is mounted on a cradle on left-hand side of engine, with provision for lateral adjustment for taking up slack in the chain.

The power plant is unit construction, with plate clutch and four-speed gearset having four-point attachment to frame. The chassis frame members, which are 3 mm. in thickness, have the unusual depth for a car of this size of 6 in., while the top flange, which is broadest where the rear of engine is attached, is also 6 in. A cast aluminum dashboard and toe board, carrying steering gear support, is bolted to dash by two brackets. Drive is by open propeller shaft with two ball bearing universal joints, and spiral bevel gears are used in rear axle. The engineers have decided on the use of Adex type front wheel brakes on this chassis, although these are not shown on the exhibition model.

Metallurgique Overhead Model Job

The Metallurgique Company has also produced a modern type 122-in. overhead valve model with detachable cylinder head and overhead camshaft driven by vertical shaft and helical gearing contained in the forward portion of the block casting. Pump and magneto are on opposite sides and driven from the vertical shaft. On this engine Metallurgique has extended the crankcase webs up to the frame members and brought the aluminum dash down to form a tight joint with the engine base, so that all air is expelled laterally through louvres in the bonnet. Steering is right hand with change speed and brake levers on the top of the box, propeller shaft is inclosed and front end of housing is received in a sphere on rear face of gearbox housing. Front wheel brakes are of the Adex type, but without diagonal control.

A new eight ahead is shown by the Dunamis Company, an Antwerp concern. The eight cylinders have valves on one side and are a single casting, but with the detachable head in two parts. This car is fitted with the Miesse type of front wheel brake with the camshaft carried on the brake flange, ahead of the steering pivot and control by a cable passing round a pulley above the king bolt and another on the top of the frame to the main levers across the frame back of the gearbox.

Minerva has gone into production on a 122-cu. in. car, the smallest model produced by this firm, and, like the others, equipped with a Knight engine. Minerva is making use of the Perrot type of front wheel brake on several models. In Belgium the Adex type of brake with camshaft carried in the axle, is more extensively em-

ployed. This brake is designed by De Coninck, chief

engineer of the Excelsior Company, and in addition to its use on this make is found on Nagant and Metallurgique cars. Miesse is showing a car with an 183-cu. in. four-cylinder overhead valve having an all-aluminum rear axle. Imperia-Abadal announces the forthcoming appearance of a cheap car with a sleeve valve engine of about 68 cu. in. piston displacement. This will be the smallest engine built in a Belgian factory. The French Farman Company is showing here the latest type six-cylinder high-grade model now fitted with the Adex type stabilizer designed to prevent lateral displacement of the rear axle.

In the truck section the leading novelty is a new 2-tonner produced by the Fiat Company. This chassis, which evidently has been designed for omnibus service, has the driver's cab alongside the engine, with the change speed and brake levers practically level with the center of the cylinder casting. Every feature of this chassis shows a departure from previous Fiat practice in truck design.

Fiat Truck Engine

The engine is an overhead valve type of 95 by 140 mm. bore and stroke, with the valves mounted vertically in a detachable head and operated by push rods and rockers. The rods go through the head and have their stems hidden by a detachable aluminum plate. The rocker arms shaft is in two parts, with coil springs mounted on the shaft between each pair of rockers and each one lubricated from an oil reservoir filled by hand; there is no direct flow of oil to the overhead gear, but the three main and connecting rod bearings are lubricated under pressure.

A feature of the carbureter is that it is bolted to the left-hand wall of the crankcase and has a single vertical tubular intake manifold up to the valve port. The exhaust manifold is jacketed with an air intake at the base of the jacket, so that the main supply of air to the carbureter passes around a long length of the exhaust. A supplementary cold air inlet, adjustable by hand, exists on the body of the carbureter. Instead of being driven from a cross shaft, the magneto is placed fore and aft, back of the timing gear housing, with the water pump ahead of the housing. The electric generator is on the opposite or carbureter side of the engine, placed fore and aft, and apparently driven by chain from camshaft.

Clutch housing and gearbox form a unit with the engine, the whole being bolted to the frame members at four points. An electric starter, mounted in a circular housing back of the left-hand rear crankcase hanger, is a part of the equipment. Although the change speed lever is carried forward, about level with No. 3 cylinder, all connections are internal and the gearbox lid, covering the full area of the box, has all angles rounded off.

Overhead worm gear is found for the first time on a Fiat production. The worm housing is an aluminum casting bolted to the axle formed of two steel pressings welded together in a horizontal plane. Another new feature for Fiat is an open drive shaft with a triple fabric joint at each end. Both sets of brakes are on the rear wheel drums. Fiat steel disk wheels are used with 895 by 135 mm. pneumatic tires, the rear wheels being dual. The weight of the chassis is stated to be 1¾ tons, for a useful load capacity of 2 tons.

A TYPESETTING omission occurred on page 1066 of AUTOMOTIVE INDUSTRIES dated Nov. 30, which may create a false impression concerning the necessary thickness of the Burt Single Sleeve Valve. For engines of 4½ in. diameter bore a sleeve of 0.125 in. thickness is used, not 0.25 in. as stated.

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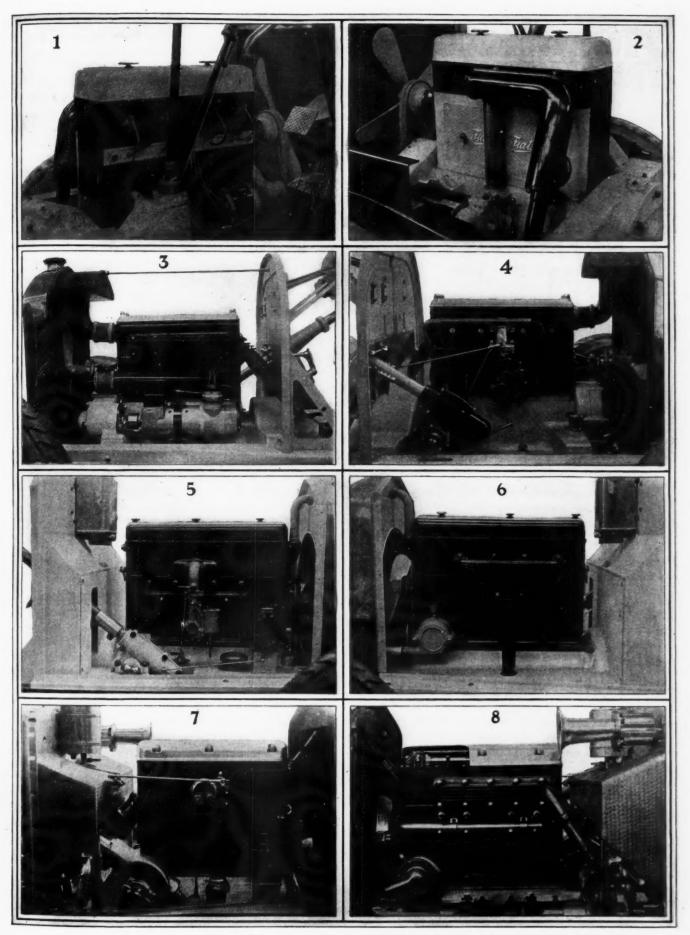
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1 and 2—Overhead valve engine of new Fiat 2-ton truck with controls alongside engine. Note hot air muff on exhaust and tubular intake manifold. 3 and 4—Sava 122-in. overhead valve engine with Bosch combined generator and distributor. 5 and 6—Clean lines are a feature of 122-in. overhead valve Metallurgique. 7 and 8—Ballot 122-in. overhead valve engine with overhead camshaft



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Getting Better Transportation

TRANSPORTATION interests in the United States are going to get together. They are going to pool their knowledge of how to carry people and commodities from one place to another. Motor vehicle, railroad and waterway executives plan to correlate the activities of their separate means of transportation in an effort to gain further development for each industry through rendering the most efficient possible service to the public.

These optimistic statements are based on the fact that motor vehicle, railroad and water carrier representatives sat together last week for the first time and discussed, under the auspices of the United States Chamber of Commerce, ways and means of providing an adequate and effective transportation system for this country. The scope of the task and the magnitude of the interests involved render rapid action both impossible and inadvisable. Investigation and analysis must precede action. The important

thing is that cooperative action on the part of the three interests is necessary to a proper solution of the problem. And last week for the first time, they did get together and discuss their problems over a common table.

The results of the meeting, though not startling. were distinctly encouraging. Resolutions were passed calling for the formation of a committee to be in contact with the public. The president of the U.S. Chamber of Commerce is requested to form a general committee for the purpose of study and investigation of the problems of nation-wide transport development.

The effort to build up a comprehensive and useful transportation plan for the country will have the entire sympathy and support of automotive executives.

Economic Value of Highways

N important announcement in reference to the A economic value of improved highways was made by Thomas H. MacDonald, chief of the Bureau of Public Roads, at the meeting of State highway officials in Kansas City. It was based on a scientific study of highway traffic in Connecticut and Massachusetts.

This survey shows that 73 per cent of the highway commodity movement consists of the products of manufactures, the remainder being divided among the products of agriculture, mines and forests.

From figures which have been published by the Iowa Experiment Station, assuming gasoline to cost 24 cents per gallon, the cost of the fuel alone for moving this tonnage per mile per day would be \$26.44 over an ordinary dirt road, assuming the impossible, that such traffic could be carried over a dirt road.

The cost of fuel for moving the same tonnage over a paved road would be \$11.70, a difference of \$14.74 per day. On the basis of 300 days per year the actual saving in fuel alone moving this tonnage, which comes from the actual movements, would be \$4,022. The paved highway costs approximately \$40,000. The average interest at 5 per cent would be \$1,000, which, deducted from the actual saving on fuel, would leave a balance which would retire the cost of the road in a little over eleven years. The maintenance costs are not figured in either case, but a greater maintenance charge could be deducted than the roads are actually costing, and still the balance of the saving would be sufficient to retire the cost within what we believe to be a reasonable period for the service of the road without extensive repairs.

"Here are the astonishing figures of the cost of an improved highway constructed at prices which are above what we believe will be the general average of such costs, and the saving in the fuel consumption alone is sufficient to pay the cost of the highway plus interest charges plus maintenance, and the tremendous passenger traffic is carried on this basis, free of cost," says MacDonald.

"Individually the cost is not distributed on the basis of commodity hauling, but the public as a whole, through its saving in fuel alone is enabled to build highways of the type demanded, and the very large saving on passenger traffic can be entirely neglected." ies

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Small Town Dealers Predominate in Successful Sales Forces

RIFTY-FIVE per cent of the passengercar agencies in the United States are located in towns of less than 5000 population. Only about 11 per cent are in towns of more than 100,000. This distribution of car agencies coincides in a general way with the distribution of automobiles in use, an estimate made some time ago indicating that about 55 per cent of the cars registered are in towns of less than 5000 population.

The most successful passenger car companies have a large proportion of their dealers in the smaller towns. This holds true in general throughout all price classes. Most of these companies got their first distribution, of course, in the larger centers, but expansion and steady production success came through a more intensive cultivation of territories and through extension of dealer organizations into semi-rural and rural districts.

These are the general conclusions reached from a study of figures recently compiled by AUTOMOTIVE INDUSTRIES covering the dealer representation of each of 52 leading passenger car builders.

Low-priced car makers have a larger proportion of their representation in the small towns than do builders of higher priced models. This is to be expected as the lower priced car meets the requirements and conditions of the semi-rural districts better than the high-priced one. The most successful cars in the "under \$1000" price class have anywhere from 68 to 78 per cent of their dealers in these small towns. Other cars in this low-priced group which have had many good years, but which have not been so consistently successful, have small-town representation ranging from 45 to 60 per cent.

THE same general trend holds true in the middle-priced group. One very successful car in this price class, for example, has 90 per cent of its dealers in towns of less than 25,000 population, while one of the less prominent makes of the same price has only about 38 per cent in similar towns.

In the high-priced group a prominent manufacturer has 70 per cent of his dealer

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representation in towns of 25,000 or under, and a less successful maker has 44 per cent.

The combination of success and wide dealer distribution is natural. When a new company starts in the field, its first need is a certain number of immediate sales. It takes nearly as long to sign up a dealer in Podunk as in New York, but the sales per dealer are greater in the latter case. Consequently, the new company begins by signing up distributors in some of the large cities.

EXPANSION and stabilization of factory output are obtained later through a more intensive cultivation of the various territories. Large city representation is not sufficient, even in the case of comparatively high-priced cars. While the metropolis has the denser population, it also has the keenest competition and the highest selling costs. Permanent stability demands intensive merchandising throughout every territory in which the car manufacturer is represented.

From the standpoint of net profit over a period of years, five States covered completely with good dealer representation is likely to be worth more than single distributors in one large city of each State in the Union. Car makers, generally recognized as successful throughout the industry, have built their progress upon this basis as is shown by the figures quoted above. The growth of the automotive industry itself has been made possible through dealer selling efforts in the smaller cities and towns.

Present competition for dealers is keen. Hard selling effort will be necessary throughout 1923 in both the wholesale and retail fields. The time has passed when any manufacturer can go ahead by picking the soft spot. The cream has been skimmed off the sales bottle. New territories must be developed; old ones must be cultivated more intensively. New dealers must be brought into the automotive field; old ones must be made more efficient. Thorough covering of given sales areas must replace selling efforts made only in those places where representation is easy to get and sales easy to make.

N. G. S.

Dealers Predict Big Sales to July

Caution After That in Air at Chicago

Believed That Car Makers Should Not Push Sales During Last Half Year

CHICAGO, Jan. 29—Distributors from all sections of the country who have arrived here for the annual meeting of the National Automobile Dealers' Association bring highly optimistic reports of the business outlook for the immediate future.

They are almost unanimous in the assertion that they will have no trouble selling all the new cars they can get from the factories for the first half year. This applies to practically all companies which are doing any business at all.

These distributors provide a reliable barometer of business. They know conditions in their territories and they can forecast pretty accurately what is going to happen in the next few months. They have their own system of making market analyses and they are reasonably accurate.

New High Levels Predicted

There are at least two points on which these men are agreed, one is that unless there is a startlingly sudden change in conditions, business probably will reach new high levels from now until July. The second point is that the entire industry should watch its step after the beginning of July. This attitude of caution is in the air. It isn't based on anything especially tangible, but when a score of men from widely scattered districts are in harmony, their opinions are well worth considering.

Reduced to its simplest terms, the position of the distributors is that manufacturers cannot expect to continue all year making and selling cars at the speed which will be necessary in April and May to meet demand. They contend that car makers will be exceedingly foolish if they try to push sales after midsummer. They feel that dealers should be permitted to determine for themselves how many cars they can sell, and they make no secret of the belief that there will be a sharp falling off the last half.

The problem of handling the used cars, which will be taken in trades, looms large in their considerations. Notwithstanding their expectation that business will decline after July, distributors are

Business in Brief

NEW YORK, Jan. 29—Generally improved market conditions featured the week's tradings, with indications of a slightly upward trend in prices. Delivery of commodities are still being hampered somewhat by the inadequate transportation facilities, and orders are being taken with this condition more or less in mind. The same condition is retarding new building construction, although there is a strong disposition toward extensive operations.

Varied buying interests added a healthy tone to the steel market. Motor vehicle manufacturers increased their purchases, and rail equipment makers are well in the market, which have helped to keep programs of steel producers at a high point. Some of the mills report capacity operations, with indications that they will continue so throughout the quarter, at least.

In the steel industry as in other industries there is a pronounced shortage in labor, which has affected total output to some extent. Automobile building plants have complained of the shortage, particularly as it refers to skilled workmen.

There was an increase in bituminous coal production, the week's output approximating 11,000,000 tons. Anthracite, however, showed a decrease of 5 per cent as compared with the week before.

A new record in car loadings was reported for the week ending Jan. 13, with a total of 873,251 cars, an increase of 102,948 over the previous week, and a gain of 159,060 over the same week last year.

Dullness marked the stock market, trading being restricted by the situation in Germany. Bank clearings showed a loss but a gain over a year ago. There was a decrease over last year in the number of bank failures.

of the opinion that the number of cars sold will equal or exceed the record established last year. They can't see anything else.

Leaders of the trade, coming even from the Northwest, which has made slower progress than other sections in the process of recovery, assert that business next year will be 65 per cent of normal.

Wide Interest Shown in New Dealerships

Many New Connections Being Made—Retail Sales in January Are Brisk

CHICAGO, Jan. 30—Talks with factory representatives here today attending the National Automobile Show, indicated a keen interest on the part of successful merchants in other lines in the prospects of obtaining good automobile dealerships. Sales representatives of two makers of high grade cars said they had been surprised at the number of such inquiries.

Virtually all the sales representatives interviewed said the dealer interest in this show greatly surpasses that of last year and that many opportunities for new dealer contracts have been offered.

With the better established companies the selection of new dealers is being made carefully and not so much for the purpose of enlarging sales representation as for replacing weak dealers and strengthening the organization.

Territories Being Analyzed

Some of the manufacturers are studying their territories very closely with the idea of getting their distribution points better placed geographically. In some cases, it has been found that a particular territory can be served better by moving a dealership from one town to another, and the factory men are taking steps at this show to make such changes. Companies needing wider dealer representation say they are finding an abundance of available connections at this show, and they, too, are watching carefully to get the best they can.

Sales departments invariably report wonderful progress in retail sales since the New York Show. Some dealers who figured their January shipments would provide them with enough cars to stock for the spring demand are selling all the cars they are getting, and are beginning to wonder whether they will be able to get enough cars to meet their spring requirements.

Most of the dealer meetings and dinners are scheduled for Wednesday.

BIFLEX COMPLETING ADDITION

CHICAGO, Jan. 29—Completion of a new factory unit now under construction at North Chicago by the Biflex Products Co. will enable the company to double its production of bumpers. The company has expanded rapidly since it was organized in 1919 and its building plan provides for still further growth.

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Plants Ready to Increase Programs

Returns From Shows Gratify Car Makers

Sustained Buying Interest Evident at Exhibits Held Throughout Country

NEW YORK, Jan. 29-The end of the Chicago automobile show this week will find the industry prepared to go ahead with programs substantially larger than those followed so far this month, and greatly in excess of those of a year ago. While there has been no lull in factory operations during the time between the New York and the Chicago shows, the major automobile producers thus far have followed the schedules of early December. With operations conducted on higher levels from now on, production will gradually move forward until capacity is reached sometime in March.

Plans for increased activity have been formulated on the basis of returns from the New York show and exhibits elsewhere that have reflected sustained interest on the part of the buying public. The response to the shows has been most gratifying. Following the New York display retail sales in the metropolitan district made a notable advance and similar results were obtained in other distributing centers, such as Rochester, Buffalo, and Oakland, Cal., where exhibits were held.

None But Encouraging Reports

Interest ran strong at the Detroit and Cleveland shows, and may be accepted as the forerunner of active buying in those sections of the middle west. In none of the cities has there been any but the most encouraging sign of brisk business extending to the beginning of summer, at least.

With the passenger car market running strong, increased activity with truck builders is apparent. Factory operations are being speeded up in anticipation of a good demand with the opening of spring. The road builders' congress, recently held at Chicago, will have a pronounced effect on sales of trucks in that branch of industry. Demand continues strong for rail cars and motor buses.

The business of parts makers is being maintained on a sound footing

Traffic Heads Should See that Freight Cars are Unloaded Promptly in Order to Relieve Rail Congestion

By W. C. Le FEVBRE

Traffic Manager of the General Motors Corp.

DETROIT Jan 30

MBARGOES at several points by railroads, notably at Buffalo and Toledo, are creating serious conditions, conditions that traffic managers must recognize as likely to continue throughout the winter, and intermittently during the rest of the year. Though the principal cause of the immediate difficulty is the heavy snows which have fallen in New York state, behind this lies the fact that railroads are under-equipped to meet the heavy shipping burdens imposed by improved business conditions.

Until such time as the railroads are enabled to bring their rolling stock to an adequate and efficient basis, industry will be handicapped in its transportation requirements. In Detroit there is a local shipping difficulty caused by congestion of freight in the yards and this is having the effect of still further handicapping the industry in this particular locality.

The problem here is a failure on the part of many companies to provide adequate siding space for their freight as their businesses have increased. As a result cars are being held over by the railroads which they are unable to place and get unloaded. The city is suffering from a lack of terminal facilities and the only way to meet the situation at this time is for traffic managers in the industry to see to it that cars are unloaded promptly and freed for loading with automobiles and other finished products.

The situation with regard to automobile and other box cars for shipping is better than it has been, but it is still far from right. The industry will soon be in a position to use all the cars it can get. A little later on driveaways will relieve the situation, especially when lake service is reopened, but for the present driveaways are out of the question except in the immediate factory district.

Most of the factories have prepared for this freight situation by getting ample stocks of material ahead but some of the smaller companies are depending to a considerable extent on the regular service of the railroads. It is not likely that, aside from these companies, the industry will be handicapped seriously but it remains that provision must continue to be made for requirements months ahead of actual manufacturing.

There is no coal problem in the industry today in this district, the railroads having met this situation, but there is a problem incidental to coal supply, in that small coal operators and brokers are consigning coal into this district without order. Declination of consumers to take this coal which they have not ordered and for which they have no need adds to the difficulties of the already overcongested terminals.

Shipments to and from the West are being moved without difficulty when they are cleared from the Detroit yards. Shipments to the South experience difficulty only in being cleared through Toledo. Shipments to and from the Eastern districts are difficult, even those coming by way of the Northern route over the Canadian lines meeting embargoes at Malone, N. Y., and other points because of weather conditions.

with orders booked three months ahead, and with little variation in collections, which have been uniformily good. Sales by members of the Motor and Accessory Manufacturers' Association for 1922 reflect the stability of the industry, and the generally good conditions that prevailed throughout the year. Business ran along normal lines as regards its rise and fall for the twelve months.

During that period, sales aggregated \$419,722,880, a considerable advance over the \$238,073,945 total of the preceding year. In January they amounted to \$17,000,000, advanced to \$22,720,000 in February, \$28,670,000

in March, and reached \$33,830,000 in April. In May they went up to \$43,-700,000, aggregated \$42,000,000 in June, \$41,000,000 in July, and \$43,-700,000 in August. Sales were \$37,-300,000 in September, \$38,755,000 in October, \$38,616,000 in November, and \$34,711,000 in December.

Along with the other branches in the industry, tire production is making strong advances.

PAN MOTOR RECEIVER DEAD

ST. PAUL, Jan. 29—Robert L. Gale, one of the two receivers for the Pan Motor Co., was asphyxiated by monoxide gas in his garage.

Peckham Made New N. A. D. A. President

Resolutions Against Used Car **Trading Allowances Offered** at Annual Meeting

CHICAGO, Jan. 30-G. G. G. Peckham, head of the Ohio-Buick Co. of Cleveland, was elected president of the National Automobile Dealers Association at the sixth annual meeting which adjourned here today.

John L. Butler, Kansas City Dodge Brothers dealer, was elected first vicepresident, and Charles E. Gambill, Marmon-Hupmobile dealer in Chicago, second vice-president. F. W. A. Vesper of the Vesper-Buick Auto Co. of St. Louis, who was the first president of the organization, was re-elected treasurer.

Advertising Campaign Planned

The association decided to offer to its 700 members an advertising campaign intended to build public confidence in the dealer and in used cars. There was discussion but no decision on a proposal to undertake a survey of costs of doing business in the automobile field. Resolutions adopted condemned used car trading allowances maintained by some manufacturers, condemned forcing of excessive allotments of cars on dealers, suggested more careful market analysis by manufacturers and a cooperative study by manufacturers and dealers of the used car situation.

The resolutions follow:

Resolved by the National Automobile Dealers Association in convention assembled in Chicago, Jan. 29-30, 1923, that we herewith condemn the so-called "used car trading allowances" as an unfair and unethica! business practice and a deceit upon the public in its operation, and, be it further resolved that we respectfully suggest to the manufacturers of motor cars that the time has come to undertake such surveys of marketing conditions as will determine accurately the absorption power of marketing territory and that production schedules of all manufacturers should be drawn up with due regard to this absorption power of a marketing territory and that production schedules of all manufacturers should be drawn up with due regard to this absorption power rather than on the mechanical facilities of plants to turn out products, or based on the similar production schedules of competitive manufacturers and, be it further resolved that inasmuch as dealers and manufacturers have jointly borne items of expense in the merchandising of new motor vehicles in the past that we recommend that a greater cooperative study of the used car situation be made by both the manufacturers and dealers through their respective organizations and that such information be secured and plans outlined as will result in a satisfactory method of merchandising all automotive vehicles.

Survey Recommended

Resolved that we herewith recommend to automobile dealers generally that they make a survey of the cars in general demand in their territory, that they take only such used cars in trade for which there is an active and measurable demand and then only at a price

BULGARIA PURCHASES 8 FORDSON TRACTORS

SOFIA, BULGARIA, Jan. 7 (by mail)—Eight Fordson tractors have been bought by the Bulgarian government as a result of tractor trials held in 1920 and 1921. The price per tractor with self lift plough is about \$1,060. The importance of this sale lies chiefly in the fact that it will contribute to advertising the tractor and its possibilities in Bulgaria.

In that country kerosene burning tractors are preferred, the light 3-share plough 20 hp. type being considered most suitable. The continuous fluctuation of Bulgarian exchange is still the major hindrance to more tractor business. Many Russian refugees who have recently gone into Bulgaria are experienced farmers and will help the introduction of improved farming methods.

that will permit the handling of the used vehicle at a profit. And, we herewith condemn as suicidal the "unloading" of new motor vehicles by any factory on any dealer who is thus compelled to accept used car deals at prices which are ruinous to himself and demoralizing to the motor mer-

Cadillac Selling Parts at Fixed Catalog Price

DETROIT, Jan. 29.-Beginning Feb. 1 the Cadillac Motor Car Co. will establish the policy of selling genuine parts for Cadillac cars in every section of the United States at a fixed catalog price. The policy will eliminate practices under which owners were charged war tax, freight or handling charge, varying according to the section of the country in which the purchase was made.

In connection with the innovation, Warren M. Warner, manager of the parts department, said that no increases have been made in catalog prices. During the past year, he said, reductions have been made on parts most generally called for and the absorption of the war tax and shipping charges will represent a reduction and substantial saving for the owner.

The movement is in line with the trend in the industry toward reduced and standardized repair charges, Warner said. The movement, he added, is due to recognition that the cost of maintenance has an important bearing upon future sales. Cadillac has endeavored, he said, to make certain its future market by first building a car upon which replacement can be held to a minimum, and then fixing the price of parts so they will be standardized at a low figure.

NO PROCESS GEAR ADDITIONS

SYRACUSE, Jan. 29-For the present the erection of additional buildings for the New Process Gear Corp., a Durant subsidiary, has been abandoned.

Court Cuts Lincoln Tax to \$1,550,000

Settlement Is One-Third Original Claim—Company Officials Vindicated

DETROIT, Jan. 30-Settlement of the United States Government claim against the Lincoln Motor Car Co. was made in the Federal Court here today for \$1,550,-000, a figure reduced two-thirds from the original claim, and a figure which, if filed originally, would in all probability have made the subsequent receivership unnecessary and kept the company in the hands of the original owners headed by the Lelands.

The original claim filed Dec. 1, 1921. totaled \$4,500,000. Following fourteen months of investigation, the Government, represented by J. A. Tellier, special assistant United States Attorney General, said in court today:

No Juggling of Figures

"After an audit of the company's books the Government realized that there was no juggling of figures. We were given every freedom to investigate the books by officials of the company and by the receivers. We have found no fraud in the procuring of contracts and we found no inducements offered by officials of the Lincoln Motor Car Co. to representatives of the Government. We investigated the character of the men representing the Government in making these contracts, and found them to be honorable, conscientious, and trying to do their duty to the Government they serve."

No further action is contemplated and the company has been given a clean bill of health.

The settlement of the Government claim will leave approximately \$3,600,000 to meet claims of creditors which were shown in the last receiver's report as \$5,835,175.55 with \$1,516,337.75 in additional claims under consideration. The above claims are practically all of merchandise creditors, a large part of which had been secured by notes. There is no equity for stockholders of the company's \$7,315,600 outstanding class A stock.

Financial Condition

The financial statement of the company filed in December, 1921, showed assets of the company \$9,490,811.13 with liabilities \$9,073,105.46. The liabilities did not include anything for Government claims which were then under question, nor for outstanding stock. Assets had been reduced by appraisers from \$15,061,-492.89 at which figure they were carried on the company's books. Henry Ford bought the property in February, 1922, for \$8,000,000 and what remains from this, following payment of taxes, secured claims and the non-allowed Government claims, will go to creditors.

Henry M. Leland, at the time of the receivership, placed full responsibility

(Continued on page 254)

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Pierce-Arrow Plans to Raise \$7,700,000

Will Pay Off Floating Debt and Provide Company with New Working Capital

NEW YORK, Jan. 29—Directors of the Pierce-Arrow Motor Car Co. have approved a plan of financing to pay off the remaining \$7,000,000 of the company's floating debt and provide new working capital. Stockholders will vote on the plan at a special meeting Feb. 19.

The plan creates a new issue of \$6,000,000 first mortgage bonds, none of which will be sold at this time, but \$4,200,000 will be used to secure an issue of \$3,500,000 one-year 6 per cent notes.

There will also be created under the plan an issue of \$4,200,000 8 per cent debentures, and a new issue of 15,750 shares of prior preference stock, entitled to \$8 annual dividends, cumulative after April 1, 1923.

New Stock Authorized

The prior preference stock is convertible, and an additional 78,750 shares of common stock will be authorized to provide for the conversion privileges of this issue, the conversion being 500 common for each share of prior preference stock.

The bank loans of the company will be liquidated through the sale of \$3,500,000 one-year notes. Stockholders will be offered the debentures on a pro rata basis, each \$1,000 of debentures carrying a bonus of 3% shares of prior preference

The holders of the existing 100,000 shares of preferred stock and 250,000 shares of common stock are entitled to subscribe for \$1,200 of debentures carrying a bonus of 4½ shares of prior preference stock for each 100 shares of common or preferred stock now held. Stockholders are given the privilege of subscribing for such further amounts as they may desire to the extent that the securities are not taken by stockholders under their initial rights.

Under the terms of the plan an initial payment of 25 per cent is to be made with the subscription, the balance being due as follows: \$250 on March 30, \$250 on April 20, and \$259 on May 14, the extra \$9 being for accrued interest due on installments from March 1.

Underwriting Syndicate

All of the securities have been underwritten by a syndicate including J. & W. Seligman & Co., Hayden, Stone & Co., Chase Securities Corp., O'Brian, Potter & Co. and associates. The directors of the company are interested as underwriters. Securities not taken by the stockholders under their subscription rights will be taken over by the underwriters syndicate.

If the plan is approved by the stockholders at the meeting in February, the capital structure of the company will be as follows: \$3,500,000 one-year notes,

TRACTOR SCHOOLS AID IN ADVANCING SALES

CHICAGO, Jan. 27—A remarkable increase in the sale of tractors and other farm machinery will be shown by the annual report of the Advance-Rumely Co., in its annual report soon to be issued, according to Finley P. Mount, president of the company. The growth of the business in 1922 over 1921 amounts to 56 per cent in units, Mount said.

He attributed a large part of the increase to the results of tractor schools which the company has conducted in a number of the leading agricultural States. He predicted a slight advance in prices of agricultural implements.

\$4,200,000 debentures, \$1,575,000 prior preference stock, \$10,000,000 preferred stock, and 250,000 shares of common stock of no par value.

The general balance sheet of the company, giving effect of the proposed financing will show net current assets of \$13,804,092, and net current liabilities of \$1,466,817, taking figures as of Dec. 31, 1922.

The net current assets are divided as follows: Cash, \$1,332,846; inventories, \$10,595,425; notes and accounts receivable, \$1,813,806, and miscellaneous investments and deposits, \$62,014. The net current liabilities include \$1,358,217 accounts payable and accrued payroll, and \$108,600 customers' deposits. At the close of 1921, net current assets amounted to \$13,651,324, and net current liabilities to \$8,665,523, the liabilities including the \$7,150,000 bank loans.

Victor Rubber Reports \$86,851 Profit in 1922

SPRINGFIELD, OHIO, Jan. 26—Optimism prevailed among the stockholders at the annual meeting of the Victor Rubber Co. when reports submitted by the directors showed a profit at the close of the year of \$86,851, after charging depreciation on buildings, machinery and equipment.

Of this amount \$80,618 was set up as a reserve to take care of depreciation of finished goods during the declining price market and to provide for general contingencies. The balance has been added to the surplus account.

President H. S. Berlin announced that the corner has been turned; that with the upward trend of tire prices and the making of very satisfactory purchases of material, which will last late in the year, the outlook is decidedly encourag-

HIGHWAY MEETING POSTPONED

CLEVELAND, Jan. 29—The 1923 convention of the National Highway Traffic Association, which was to have been held in this city on Feb. 19 and 20, has been postponed.

Locomobile Factory Undergoing Changes

Preparations Being Made for Quantity Production of Mason Road King

BRIDGEPORT, CONN., Jan. 26—Announcement was made yesterday that beginning Feb. 1 the plant of the Locomobile Co. here will be closed for one month to allow such changes in machinery as coincide with the Durant ideas of manufacturing. Inventory will be taken during the month. The temporary shutdown will affect about 1200 employees. It is planned to return them all to work after the layoff, with the likelihood that the force will then be increased.

The Locomobile company, under direction of W. C. Durant interests, is expending more than \$300,000 in construction of new buildings and installing modern machinery. The additions include an improved ground-floor machine shop. All of the machine work on the passenger cars and Mason Road King trucks will be done in the building now in process of construction. The work of moving old machinery into the new plant will be started immediately.

Production Limited Now

Plans of the Durant interests provide for an output of from 30 to 36 1-ton Road Kings here a day. The latest methods of progressive machining and assembling and other production ideas required in quantity production were not to be found at the local plant, which had always produced but a limited output. Shutdown and construction of the new unit are aimed to meet this condition, it is stated.

At present the Mason trucks are being shipped to the local plant from Flint, Mich., in a knocked down condition. Shortly after March 1, it is announced, the local plant will be producing the same models in quantity, doing a large amount of the finishing work at the Seaside Park plant. Floor space which is cleared by the removal of machinery into the new plant will be utilized for storage and assembly work.

The changes, it is announced, mean no increase in the present limited production of passenger car models.

Kimball Shows New Body at Annual Chicago Salon

CHICAGO, Jan. 29 — Twenty-three closed cars, six open models and two chassis are being shown at the Eighth. Chicago Automobile Salon.

One of the displays not seen at the New York Salon is a two-passenger town brougham, exhibited on a Cadillac chassis by C. P. Kimball & Co. of Chicago. This body is an adaptation of the old horse-drawn brougham, the general dimensions being almost identical with modifications to fit the body to the chassis of an automobile.

Fisher Body Offers New Issue of Bonds

Total of \$20,000,000 to Be Used to Meet Indebtedness and Retire Stock

NEW YORK, Jan. 30—The Fisher Body Corp. offered today, through a syndicate of bankers including the Bankers Trust Co., the Guarantee Co. of New York, the Union Trust Co. of Pittsburgh and Hallgarten & Co., a new issue of \$20,000,000 6 per cent serial gold notes at a price to yield 5½ per cent to 6½ per cent, according to maturity. These notes are dated Feb. 1, 1923, and mature \$2,500,000 annually on Feb. 1, 1924 to 1927, inclusive, and \$10,000,000 on Feb. 1, 1928.

The proceeds will be used to retire outstanding funding debts and bank indebtedness, and to retire the local outstanding preferred stock of the corporation amounting to \$2,552,800, through providing additional working capital.

In addition the company has arranged, subject to formal stockholders' authorization, to issue and sell an additional 100,000 shares of common stock at \$75 a share for new manufacturing facilities.

Durant Offers to Buy

Following upon the action of the directors of the Fisher Body Corp. last week in voting to issue an additional 100,000 shares of common stock for subscription, by present stockholders at \$75 a share, W. C. Durant, president of Durant Motors, Inc., offered to buy the entire common stock issue of the corporation consisting of 500,000 shares for \$200 a share, or a total of \$100,000,000.

The offer was made in the following statement by Durant:

Many and varied statements have been circulated during the past few days with reference to the Fisher Body Corp. and my connection with it.

Some time ago I made the assertion that Fisher Body Corp. was one of the best industrial properties in the country with respect to position in the trade, earning capacity, management, etc.

While other interests might have a motive for depreciating its value at this time, I have no occasion to change my opinion of the property.

If given the opportunity I will agree to purchase the present common stock issue at \$200 a share.

It is not likely that either Fisher Body or the General Motors Corp., which owns 300,000 of the shares, will consider the offer.

New Plant for Oakland Bodies

PONTIAC, Mich., Jan. 29.—Fred J. Fisher of the Fisher Body Corp., announced plans today for the construction of a new plant to build closed bodies for Oakland cars. Work will be started within a few weeks on three initial units with floor space of 300,000 sq. ft. in addition to dry kilns and a power plant. A force of 2500 men will be required.

BERMUDA VOTES DOWN BILL ALLOWING CARS

WASHINGTON, Jan. 29—A bill to remove the restrictions on the importation of automobiles into Bermuda has been defeated in the Bermuda House of Assembly and the prohibition on motor vehicles is still in effect, the vice-consul at Hamilton advises the State Department.

The opinion is expressed in the report that the anti-automotive restriction will never be removed as the islands are apparently unalterably opposed to automobiles.

A site of 26 acres has been purchased from the General Motors Corp. at the northern edge of the city, lying along the Pontiac, Oxford and Northern Railway and on the right of way of a belt line road that has been assured by the Grand Trunk. Right of way for this railway has been pledged by a Pontiac committee.

The new plant will not replace the existing Fisher plant here, formerly Beaudettes, now working on Chevrolet bodies. The force at the plant will be doubled within a month, Fisher stated, and in addition the present Oakland body plant will be continued, turning out Oakland open jobs. The cost of the first units of the new plant will be \$2,000,000, he said.

Syra-Cord Completes Its Financing Plan

SYRACUSE, Jan. 29—Details of the reorganization of the Syracuse Rubber Co. under the name of the Syra-Cord Tire & Rubber Corp. have been announced by the reorganization managers, Stone, Seymour & Co.

The plan provides for an authorized issue of 50,000 shares of common stock with no par value, \$1,000,000 in preferred stock with a par value of \$10, and \$300,000 in first mortgage convertible bonds maturing in twenty-five years. The plan provides for the reservation of 20,000 shares of common and \$300,000 of the preferred issue to take care of conversion rights. The plan will be declared operative when \$200,000 of the new stock has been sold.

Stockholders of the old company have until Feb. 10 to join the reorganization and may pay \$30 for three shares of preferred and two shares of the new common. Owners of the old common may pay \$15 and secure 1½ shares of new preferred and one share of new common.

The new corporation starts business with total quick assets of \$480,460. Additional assets bring the total to \$1,161,872, of which \$391,908 is real estate and buildings and \$299,602 is machinery and fixtures.

The liabilities include \$132,000 in bills payable and a bonded debt which amounts to \$134,200.

Consider Standards for Starting Motors

Tentative Specifications Agreed Upon by Automotive Electric Association

CLEVELAND, Jan. 27—Tentative specifications for four electric starting motors were agreed upon by the standardization committee of the Automotive Electric Association at its regular meeting held here. This organization is composed of manufacturers of starting posed of manufacturers of starting lighting and ignition equipment. The standardization of starting motors constitutes the second step in the broad standardization program of this association, and is the initial step in standardization of a set of electric generators.

Chairman Joseph Bijur, of the Standardization Committee, wishes it to be expressly understood that these four starting motor specifications are tentative, as were the electric generator specifications recently developed. Engineers are invited to offer constructive criticisms of any of the specifications.

Specifications Brief

The four starting motors are intended to serve the entire passenger car field and truck engines of corresponding piston displacement. The suggested The suggested specifications are as brief as can be made and are intended to enable the buyer readily to select equipment by performance. These specifications are given along two lines: First, the stalled torque; and second, the horsepower at a speed of 400 r.p.m. which is supposed to give the minimum speed at which satisfactory starting can be obtained in cold weather. It is thought that if the starting motor meets these two require ments it will fulfill all other demands that can be made on it.

It should not be concluded that No.1 starting motor of necessity goes with No.1 generator, which comprises an electric installation on a gasoline engine, as the starting motors are selected according to torque requirements of the gasiline engine. These are governed largely by piston displacement, whereas the electric generators are selected by the r.p.m. at which they deliver the required electric output.

Basis for Ratings

The following ratings for 6-volt starting motors are based on a gear reduction between the cranking pinion and the flywheel of approximately 10 to 1. If the gear reduction between these two elements is substantially different a proper allowance in the performance of the motor should be made. The ratings are based on the performance of motors on a test according to the A. E. A standard voltage drop at motor terminals namely, 6 volts at 0 amperes with a drop of 0.5 volts for each 100 amperes.

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Akron Expects Good from British Visit

Tire Makers Hopeful That Rubber Restriction Act Will Be Modified

AKRON, Jan. 29—Akron tire manufacturers are hopeful of favorable recommendations for modification of the Stevenson rubber restriction and export tax law of Great Britain, by the Rubber Growers' Association's commission to this country, following a series of conferences with the British commissioners here this

The commission, including Sir Stanley Bois, P. J. Burgess and H. Eric Miller, spent three days in Akron, visiting all the rubber shops here and conferring with rubber officials. They were accompanied to Akron by A. L. Viles, secretary of the Rubber Association of America.

Sir Stanley Bois and H. Eric Miller were members of the Stevenson Committee that drafted the British colonial legislation, placing an export tax on all crude rubber produced over and above 60 per cent of the 1920 output of the British colonies.

Akron manufacturers presented statistics to the commission showing that American consumption this year would far exceed that of 1920 and that the restriction laws would mean a serious shortage of rubber. It was also stated that the export tax would increase tire and rubber goods costs and would cost American motorists and consumers of rubber goods anywhere from \$300,000,000,000 to \$600,000,000.

The three British rubber growers would make no comment for publication but Akron manufacturers admitted that the conferences with them had progressed satisfactorily and that they were hopeful of favorable recommendations for modification of the new British law.

The Britishers left here Sunday for Detroit to inspect automobile plants.

Will Visit Buffalo

BUFFALO, Jan. 27—The commission, composed of representatives of the Rubber Growers' Association of London, will visit this city next week, accompanied by H. Stuart Hotchkiss and A. L. Viles, representatives of the Rubber Association of America.

While in Buffalo the visitors will be the guests of J. H. Kelly, vice-president of the Hewitt Rubber Co. of this city. The two concerns which will be visited by the English commission are the Dunlop and the Hewitt factories.

Action Delayed in Washington

WASHINGTON, Jan. 30—Pending the outcome of the negotiations being carried on by the American Debt Commission for the funding of the Great Britain war debt to this country, it is not likely that the efforts of the administration will be used to aid American rub-

ber interests in their battle against the effects of the British export tax on crude rubber. It is expected that representatives of the Rubber Growers' Association of London, who are now in this country, will meet Secretary of Commerce Hoover in this city on Saturday of this week.

Cleveland Motorcycle Buys Reading-Standard

CLEVELAND, Jan. 29.—The Cleveland Motorcycle Manufacturing Co. has bought the good will and physical assets of the Reading-Standard motorcycle interests, which were offered for sales a week ago. Tools and equipment will be moved from the plant in Reading, Pa., to this city.

The acquisition of the Reading-Standard property give the Cleveland company both a light and a heavyweight machine in its line. The name Reading Standard will be preserved and the machines will be shown in the Cleveland booth at the coming New York motorcycle show.

DENMAN-MYERS ELECTION

WARREN, OHIO, Jan. 27—At the annual meeting of the Denman-Myers Cord Tire Co., held at the factory here, the present board of directors was re-elected. The board consists of Walter E. Myers, chairman; W. R. Denman, F. P. Dugan, L. M. Harper, P. A. McCaskey, J. E. Morris, E. H. Peck, W. B. Prenter, F. C. Raymond, F. W. Stillwagon and H. F. Webster. The report of the treasurer showed a marked increase in business last year over the year 1921.

New Company Formed for Commerce Truck

Will Buy Its Material from Inventory of Manufacturer It Succeeds

DETROIT, Jan. 29.—The Commerce Motor Truck Co. has been organized to take over the truck manufacturing business of the Commerce Motor Car Co. for which it is leasing the present plant and equipment and will continue work without interruption.

The new company is capitalized at \$200,000 and will distribute through the dealer organization of the former company. Under the plan of reorganization the old company becomes inoperative and will be liquidated through the agency of the new organization which, in addition to taking over the lease of the plant, will purchase materials required for operations from the inventory of the old company. In this way the new company starts business with a clean slate, the old company meeting its own indebtedness as it liquidates.

Walter E. Parker continues as president, with E. H. Graham, vice-president; Wetmore Hunt, treasurer; C. L. Granger, general manager; O. D. Coppock, sales manager; M. L. Pulford, service manager, and S. R. Read, chief engineer and factory manager.

The Commerce Motor Car Co. was incorporated in 1911 for \$500,000. The company latterly has been specializing to a large extent in bus manufacturing.

Rubber Commission Visits Akron



Representatives of the Rubber Growers' Association of London, now in this country at the invitation of the Rubber Association of America to discuss the effects of the British crude rubber restriction act, are visiting the important tire producing centers throughout the country. In the group are Sir Stanley Bois, Eric Miller and P. W. Litchfield of the British Commission, Lady Bois, A. L. Viles and P. J. Burgess

1922 Foreign Sales Aggregated 227,651

These Cars and Trucks Were Sold by U. S., Canada or Ford Branches Abroad

WASHINGTON, Jan. 29—Foreign markets last year absorbed 227,651 motor vehicles, inclusive of cars and trucks, manufactured in the United States and Canada or sold from the foreign branches of the Ford Motor Co., a figure that surpasses the most optimistic expectations.

A compilation by the Automotive Division of the Department of Commerce shows that during the twelve months there were produced in the United States and shipped abroad 78,560 cars and 11,445 trucks, a total of 90,005 motor vehicles and that in the same period Canada produced and exported 35,382 cars and 2564 trucks, aggregating 37,946. Ford sold from its foreign branches during that period 99,700 cars and trucks.

The accompanying table by the Automotive Division shows that for the twelve months' period exports of cars from the United States were more than double those of the previous year, shipments in 1922 being 78,560 of a value of \$59,770,791, as against 38,430, valued at \$42,869,618 in 1921.

While there was a gain in truck shipments, it was not as pronounced as in the case of cars, 7480 trucks of a value of \$10,335,893 being exported in 1921, and 11,445, valued at \$8,270,908, representing the 1922 shipments.

Value of parts, not including engines sent abroad in 1922, were \$38,298,032 and \$39,058,727 in 1921.

December shipments increased over the previous months and over the same month a year ago, with a total of 8560 cars as compared with 3157 a year ago and 5276 of November of 1922; 1771 trucks as against 511 the previous December, and 803 in November of last year; \$3,417,131 parts as compared with \$2,683,850 in December of 1921 and \$3,304,171 in November of the same year.

Canada Sets New Mark with December Exports

WASHINGTON, Jan. 27—Automotive exports from Canada during December reached the highest level in the history of the Dominion and for the first time excelled the monthly average of automotive exports from the United States, according to figures furnished the Automotive Division of the United States Department of Commerce.

The December exports were 5475 passenger cars, valued at \$3,256,230, compared with exports of 3587, valued at \$2,204,560, during November. The

Table That Shows Shipments of Products of the Automotive Industry from the United States in December, 1922, and the Totals for the Twelve Months of the Year

		of Decem				s Ending D	ecember_
	1921		1922		1921	s Ending D	
Automobiles in	Value	No.	Value	No.	Value	No.	Value
Automobiles, in- cluding chassis 3,157	\$2,853,336	8 560	\$5,703,046	38.430	\$42,869,618	78.560	\$59,770,791
Electric trucks	42,000,000	0,000	40,7 00,0 10	00,100	412,000,010	70,000	455,110,131
and passenger							
cars		49	62,678			325	450,267
Motor trucks and							
buses, except	400 054			7 400	10 225 902		
Up to 1 ton 511	498,054	1,522	503,805		10,335,893	8.292	2 267 400
Over 1 and up to		1,522	303,803			0,232	3,267,127
21/2 ton		197	245,391			2,450	3,076,811
Over 21/2 ton		52				703	
Over 21/2 ton Total motor		-	,				.,0,5,0
trucks and							
buses, except							
electric 511	498,054		862,378		10,335,893	11,445	8,270,908
-		PASSE	NGER CA	RS			
Passenger cars,	0.055.000			20.050	20 522 705		
except electric.2,646		4.007		30,950		42,232	00 505 050
Value up to \$800 Value over \$800		4,297	1,948,343			42,232	20,505,056
and up to							
\$2,000		2.266	2,354,445			22,532	24,619,341
Value over \$2,000		177				2,026	5,925,219
Total passenger			1, 0,202			_,	0,020,213
cars, except							
electric2,646	2,355 285	6.740	477.990	30,950	32,533,725	66,790	51,049,616
			RTS, ETC.				,,,,,,,
Parts, except en-							
gines and tires	2,683,850	*13,537,065	3,417,131		39,058,729	*160,523,442	38,298,032
Accessories, parts							
of		*476,242	20,738			*6,786,225	2,700,861
Station and							
warehouse motor trucks 19	19,494	19	9,123	326	258,559	149	440.040
Trailere	19,494	17			230,339	469	
Trailers	35,000		,		314,940	41	
Parts of air-	33,000			40	314,340	71	197,030
planes, except							
engines and							
tires	1,480	*F97	817		151,608	#471,495	265,481
		BICY	CLES, E	TC.			,
Bicycles and tri-							
cyc.es	113 721	2,042	15.153		1 539.890	14 275	
Motor cycles 863	250,457	1,437	317,261	11,001	3,517,769	15,976	4,028,742
Parts, except		+005 744	440 045			40.044.007	4 888 444
tires		*235,711	119 845			*2,914,367	1,573,663
005	48,786		66,913	1 220	362,570	E 040	700 077
Gas engines 225	40,700	1,207	00,913	1,320	302,570	5,818	709,877
Traction engines (steam) except							
agricultural 1	4,775	4	10,623	74	123,147	38	75,749
Automobile en -	4,110		10,020		120,111	30	10,119
gines 1,951	275,109	1,780	275,532	9,632	1,821,120	44,896	5,132,754
Aircraft engines		17	1,400			147	
Complete trac-							
Complete trac- tors, except			40.0==				
agricultural 7	29,771	4	16,387	5,206	5,770,751	49	138,585
Other internal							
combustion en-	66 040	670	105 110	0 115	1 560 600	F 004	000 10-
gines 504	66,848	679	105,118	0,115	1,569,622	5,331	833,425

monthly average from the United States was 5400 for the entire year of 1922.

*Pounds

Truck exports from Canada in December were 216, valued at \$173,230, compared with 428 in November, valued at \$152,073. Value of parts exported in December was \$221,403 again \$264,622 in November.

Makers of Asbestos Brake Lining Form Association

NEW YORK, Jan. 30—Perfection of the Asbestos Brake Lining Association, an organization of the manufacturers located in various parts of the country, has been announced by S. S. Simpson, president of the Raybestos Co. of Bridgeport, who is also president of the newly formed body. The association has opened an office at 17 West Forty-second Street.

Arnold A. Mowbray has been elected commissioner of the organization. He formerly served as executive secretary of the National Selected Morticians and also was manager of the membership department of the National Association of Credit Men.

Engineers Call Meeting to Consider Safety Code

NEW YORK, Jan. 27—The American Engineering Standards Committee has called a conference Feb. 17 at 9.30 a.m. in the board room of the American Society of Mechanical Engineers, this city, to discuss a national safety code for the forging industry and for plate and sheet metal work.

The conference is called at the request of the safety code correlating committee, which has had the subject under consideration for some time as a result of proposals made to it.

Among the organizations in the automotive industry invited to send representatives to the conference are the American Drop Forging Institute, the American Gear Manufacturers Association, the American Society of Mechanical Engineers, the Detroit Steel Products Co., the National Automobile Chamber of Commerce, the National Machine Tool Builders Association, the National Metal Trades Association and the Pressed Metal Association.

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Men of the Industry and What They Are Doing

Sir Eric Geddes Sails for New York

Sir Eric Geddes, brother of the British Ambassador to the United States and recently elected chairman of the Dunlop Tire & Rubber Corp. of America, has sailed for New York on the steamship Olympic.

White Co. Makes Promotions

Robert W. Woodruff has been appointed vice-president in charge of distribution, and chairman of the sales committee of the White Co. Associated with him as a member of the committee will be Vice-President George F. Russell. Additional promotions announced by the company brought vice-presidencies and membership on the sales committee to George A. Urquhart, district manager for the Pacific Coast territory, who will retain his headquarters in San Francisco, and to J. Hartley Phillips, manager of the Pittsburgh district. Mason B. McLaughlin at his own request asked to be relieved as vice-president and member of the sales committee and will resume the management of the central sales depart-

Clough Succeeds Miller

H. J. C. Miller has resigned as general sales manager of the Winton Co., with headquarters at the plant in Cleveland, and will take a brief vacation before definitely deciding upon future plans. At the time of his appointment in November, 1920, Miller had been serving as manager of the Winton branch in New York City for three years. During the past year he personally directed the evolution of Winton sales from a branch house system to a dealer distribution.

C. Roy Clough, formerly identified with the Stephens Motor Car Co., has succeeded Miller. Prior to his Stephens connection he was associated with the Buick Motor Co.

Baker Made Sales Manager

James A. Baker has been elected sales manager of the Connecticut Telephone & Electric Co. of Meriden, Conn., succeeding C. E. Stahl, who held this position for the last eight years. B. C. Rogers has succeeded E. Ç. Anderson as sales promotion and advertising manager. Rogers has been associated with the company for the last fifteen years.

Laycock Representing Waukesha

Arthur M. Laycock has been appointed to represent the Waukesha Motor Co. in the East, with headquarters at 110 West Forty-second Street, New York. Laycock was formerly identified with the English Daimler and the London General Omnibus Co. and served as general manager of the Fifth Avenue Coach Co. during the war. He was chief engineer of the Sheldon Axle & Spring Co. for eleven years. In the development

of its new engine the company has developed a system of unit coordination, which, it is claimed, will make great economies possible.

Planning Trips Abroad

L. M. Rumley, formerly manager of the European division of General Motors Export Co., is planning a trip to Sydney, Australia, to open a new export branch there for the company. A. L. Quinn of the same organization is planning to go to South America to conduct an extensive investigation of export market condi-

Cole Adds Edwards to Staff

F. E. Edwards, formerly chairman of the technical committee of the Contest Board of the American Automobile Association, has joined the staff of the Cole Motor Car Co. of Indianapolis as traveling representative in the Middle West. Edwards has been connected with the industry for twenty years.

Willis Changes Agency

P. P. Willis, who for years has been handling the Toledo office of the Martin V. Kelly Co. and who, prior to that connection, was advertising manager of the National Motor Car & Vehicle Corp. of Indianapolis, has become identified with the United States Advertising Corp. of Toledo.

A. J. Sanderson with Mueller

A. J. Sanderson has resigned as general sales manager of the Maccar Truck Co. of Scranton, Pa., to become vice-president of the Mueller Engineering Co. of that city.

Terhune Given Sales Territory

Royal E. Terhune, formerly associated with the Uehling Laboratories, has been placed in charge of the Northern New Jersey sales territory of the Uehling Instrument Co., Paterson, N. J., manufacturer of power plants and equipment.

Stevenson Joins Van Wheel

George R. Stevenson, formerly connected with the sales department of the Smith Wheel, Inc., of Syracuse, N. Y., has become a member of the sales organization of the Van Wheel Corp. of Oneida, N. Y., manufacturer of the Van metal wheel.

GLIDER TROPHY OFFERED

CHICAGO, Feb. 1—Eddie V. Rickenbacker, vice-president of the Rickenbacker Motor Co. of America, flying ace in the world war, has offered a \$5,000 trophy to be awarded annually to the winner of a glider contest. Rules governing the contest, which must be held in America, are similar to those used in the Pulitzer airplane trophy.

Voorhis Retirement Announced by Nash

Action Long Contemplated—Earl H. McCarty Named

Successor

CHICAGO, Jan. 31—C. B. Voorhis, vice-pres.dent and general sales manager of Nash Motors Co. of Kenosha, Wis., is retiring from the automobile industry, it was announced today by President C. W. Nash. At the same time his successor was named, Earl H. McCarty, who has been with Nash for a year and a half, a man who has been trained for his important position since he came to Nash from Studebaker, when he was assistant to H. A. Biggs.

Voorhis announced more than a year ago that he planned retiring because of his desire to devote himself to his private business investments. Nash, however, persuaded him to remain with him until his successor could be trained in the business methods of Voorhis which have contributed so much to Nash success. Voorhis now feels that he can step out without interfering with Nash prog-

Voorhis will retain his residence in Kenosha and he will be available for consultation on Nash policies.

Standard Reorganized; New Company Controls

PITTSBURGH, Jan. 31—The Standard Motor Car Co. has undergone a reorganization. A new company was incorporated under the laws of the State of Delaware in December with a capitalization of \$500,000 to take over the automotive department of the Standard Steel Car Co. and the old Standard Motor Car Co., which had been operating up to that time with only a nominal capital.

The new company, it has been learned, is entirely disassociated from the Standard Car Co., though it will use the facilities formerly bestowed upon the old motor car company by the Standard Steel Car Co. at its Butler plant.

All the physical properties of the Standard Steel Car Co., in so far as they relate to the manufacture of automobiles, have been taken over by the new company. The business has been carried on interrupted during the process of reorganization.

The new interests in control of the company are said to be from the East. D. C. McHord, who was president of the old motor car company, has been made president of the new concern. The other officers are E. C. Johnston, vice-president; M. R. Blish, secretary, and E. A. Lewis, treasurer.

RAIL, WATERWAYS, MOTOR HEADS MEET

Seek Coordination in Transport Work

National Policy May Come From Meeting Called by U. S. Chamber of Commerce

NEW YORK, Jan. 31—One of the longest forward strides ever taken in the process of bringing the railroads of the country into their proper relationship with transportation as a whole was recorded at a meeting in New York last Saturday, called by Julius H. Barnes, president of the Chamber of Commerce of the United States. It was attended by Secretary of Commerce Hoover and representatives of the railroads, automotive industry and waterways interests.

The purpose back of the meeting was to initiate a thorough study of the transportation needs and facilities of the country with a view to coordinating them and bringing them into the closest possible cooperation. Some plain truths were spoken but they were accepted in a give-and-take spirit and complete harmony prevailed.

Railroad men were told frankly that up to this time they had assumed that the steam carriers made up the transportation system and that they had too long regarded motor vehicles and waterways as interlopers taking away from them the business which rightfully belonged to them.

Better Understanding As Result

This meeting and the survey, which is contemplated, will do more than anything which ever has happened to bring the railroads to a more complete understanding of the part motor vehicles can and should play in the movement of freight and passengers. Representatives of the automotive industry told the railroad men that no claim is made that motor vehicles ever can take the place of the railroads, but it was contended that trucks provide the most economical means for handling short haul less-thancarload lot freight.

Another point made clear to the railroad representatives was that the automotive industry is the biggest single customer they have; that its only interest is to serve the nation and to have the best possible freight service to meet its own needs.

As a result of the meeting a large committee, representing all forms of transportation, will be appointed to make a thorough study of the situation and to recommend means for bringing about

coordination which will enable each transportation unit to render a maximum of efficient service.

From the point of view of the automotive industry, the meeting marks the beginning of the end of the vicious attacks made upon it by the carriers. It is probable that within a comparatively short time the two industries will be found working in close cooperation.

The following resolutions were adopted at the meeting:

Resolutions Adopted

Whereas, it is apparent that a comprehensive study of the whole question of national transportation, participated in by the railways, shipping interests, producers, the motor industry, waterway operators and the public, and with the cooperation of government representatives, should be undertaken at once, to assure adequate transportation of our ever expanding domestic and foreign commerce;

Whereas, a coordinated national transportation policy required consideration of these chief phases: governmental relations to transportation; possible railroad consolidations; possible readjustment of relative freight rate schedules; proper coordination of motor transport and use of highways and proper coordination of waterway service.

Whereas, in order to avoid duplication of investigation and direction, it is desirable to utilize present sources of information and experience through a central source and in such manner as to carry public confidence and conviction on its conclusions.

Therefore, resolved that it is the sense of this meeting that the president of the Chamber of Commerce of the United States is hereby requested to form a general committee for the purpose of suitable consideration and action, from the various interests represented, from the Chamber itself and from any other helpful bodies, and including some proper form of contact with the Department of Commerce, the Interstate Commerce Commission and other agencies of government, and that such a general committee be convened at the call of the president of the Chamber to work through subcommittees or otherwise for the purpose of study and investigation and resultant reports and recommendations upon these or any other phases of nationwide transportation development.

Those at Conference

Among those attending the conference were the following:

A. J. Brosseau of Mack Trucks Inc., J. Walter Drake of the Hupp Motor Car Corp., Alvan Macauley of the Packard Motor Car Co., A. H. Swayne of the General Motors Corp., and Geo. M. Graham of the Chandler Motor Car. Co.

Samuel Rea of the Pennsylvania Railroad, A. H. Smith of the New York Central lines, C. H. Markham of the Illinois Central, Daniel Willard of the Baltimore & Ohio, Carl R. Gray of the Union Pacific, Howard Elliott representing the Northern Pacific and New York, New Haven and Hartford, and Hale Holden, chairman of railway executives.

H. H. Raymond of the Clyde Steamship Co., W. H. Clause of Pittsburgh, chairman of the waterway committee of the United States Chamber of Commerce, George A. Post, chairman of the railway committee, C. P. Creig of Duluth and Julius H. Barnes.

S.A.E. Discusses Flat Rate Service System

Standardization of Electric Equipment Urged at Chicago Meeting

CHICAGO, Jan. 31—Flat rate and piecework system of selling service, cooperation between manufacturer and dealer and standardization of electric systems on motor cars were the chief topics discussed at the technical sesions of the Society of Automotive Engineers Service Meeting today at the Congress Hotel.

Donald T. Hastings of Williams & Hastings, Hupmobile dealer, Detroit, told of the new attitude toward service and gave a complete presentation of the manner in which his company is making maintenance pay by use of the piecework plan.

The dealer who has put in good service, the speaker said, is impressed almost every day by the remarks of prospects to the effect they were inclined to buy some competitor's car until some car owner boosted the dealer's service.

Speaks on Cooperation

Automotive service cooperation between manufacturer and dealer was the topic chosen by J. F. Page, manager of service, Packard Motor Car Co., Chicago. Page said that factory car inspection was the most important phase. Dealers should not be expected to spend considerable money in conditioning new cars for owners. Interchangeability of parts and standardization, he said, should be given more attention to reduce dealers' parts stock.

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L. C. Hill of the S. A. E., who presided at the morning session, read a paper dealing with the features of service in the establishment of Funderburg & Mitchell, Boston Ford dealers. The afternoon session was presided over by Clyde Jennings, editor of Motor Age, and at this time the paper on electrical standardization effect on maintenance was presented by A. H. Packer, also of Motor Age. Packer made a special plea for standardization of generator armatures and such parts as distributor shaft Uniform wiring methods mountings. were suggested.

E. S. Jordan was a speaker at the banquet this evening.

FORD'S FOREIGN PRODUCTION

DETROIT, Jan. 31—Final figures for the year on production in Ford's foreign plants give Manchester 27,194; Buenos Aires, 11,871; Copenhagen, 10,552; Bordeaux, 10,548; Cadiz, 5331; and Sao Paulo, 3362. A total of 68,985 tractors were built during the year. n

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ASSOCIATION EXECUTIVES AT CHICAGO

Output in January May Reach 224,000

N. A. C. C. Directors Told Gain Over December Likely to Be 9 Per Cent

CHICAGO, Jan. 31—Directors of the National Automobile Chamber of Commerce at their monthly meeting held today at the automobile show were treated to a surprise when James S. Marvin, head of the Traffic Division, reported on the probable production for the month of January.

Basing his estimate on shipping returns for the first three weeks of the year, Marvin told the directors that the figures for the month would show approximately 224,000 motor vehicles, the greatest January on record and exceeding December by 9 per cent. In this estimate Ford was running high, while the returns from the N. A. C. C. members show an increase of 125 per cent over January of last year.

While January of last year exceeded December, 1921, still the latter month was an exceedingly poor one, whereas December, 1922, was surprisingly good, so that this January's showing is all the more extraordinary.

Railroad Situation Better

The directors also were told there is a general improvement in the raiiroad situation. Bad order locomotives had dropped to 24 per cent in January, while bad order cars are only 9½ per cent, whereas six months ago they were 15 per cent. Car shortage was down to 73,000 Jan. 15, which is 106,000 fewer than six months ago. Revenue car loadings are maintaining their record level and are more than 150,000 over three weeks ago. The directors also decided to press the campaign to have the Government remove the excise tax.

The Insurance Committee advised that at a meeting with the Committee of Underwriters it was reported that the new rate committee of the Automobile Underwriters Conference has approved the principle of grouping automobiles for rate making purposes on records of experience with the various makes of cars. This means that instead of having a company submit a car for approval for the purpose of securing a rating, the underwriters will rate it on the experiences of the previous year.

Gordon Lee, export manager of the Yellow Cab Manufacturing Co., appeared before the directors and appealed for a definition of taxicab. It is not rated as a passenger car because it is used for commercial purposes, but Lee contends that it should be classed as a passenger car. The matter has been referred to the Show Committee.

\$1,751,521,000 VALUE OF 1922 PARTS SALES

CHICAGO, Jan. 31-Amazing figures on the size of the parts industry were presented by Ezra W. Clark, chairman of the Advertising Managers Council of the Motor and Accessory Manufacturers Association, at a meeting here today. In his estimate he fixed the value of parts, units and accessories sold to vehicle manufacturers in 1922 at \$982,952,000. The total value of part, unit and accessory replacements for the same period is estimated by Automotive Industries at \$768,569,000, making a total volume of \$1,751,521,000, as compared with a total estimated wholesale value of \$1,786,077,000, for the cars and trucks sold last

The general subject of the meeting here was "How Can Parts and Accessory Manufacturers Aid in Developing the Market for Specialized and Fully Equipped Cars and Trucks." All the speakers urged an earnest effort to inform the public of the intrinsic value of such vehicles. Clyde Jennings, editor of Motor Age, made a strong point when he said that there can be no such thing as an orphan car if it is assembled from specialized units.

Standards Considered for Starting Motors

(Continued from page 248)

The specifications tentatively drafted are:

Starting Motor No. 1

This motor at a speed of 400 r.p.m. should deliver a locked torque of not less than 10.5 lb.-ft. with a current not exceeding 500 amp. At a speed of approximately 400 r.p.m. it should deliver not less than 0.5 hp.

Starting Motor No. 2

At a speed of 400 r.p.m. No. 2 motor should deliver a locked torque of not less than 14 lb.-ft. with a current not exceeding 575 amp. At a speed of approximately 400 r.p.m. it should deliver not less than 0.7 hp.

Starting Motor No. 3

At a speed of 400 r.p.m. starting motor No. 3 should deliver a locked torque of not less than 18 lb.-ft. with a current not exceeding 600 amp. At a speed of approximately 400 r.p.m. it should deliver not less than 0.85 hp.

Starting Motor No. 4

At a speed of 400 r.p.m. starting motor No. 4 should deliver a locked torque of not less than 24 lb.-ft. with a current not exceeding 725 amp. At a speed of approximately 400 r.p.m. it should deliver not less than 1 hp.

N.A.C.C. Advertisers Hold Good Session

Members Discuss Problem of Local Advertising and Determining Consumer Media

CHICAGO, Feb. 1—Two days' discussion on subjects nearest their hearts brought the advertising managers, representing members of the National Automobile Chamber of Commerce, much closer together than has any previous session of this sort ever undertaken by the N. A. C. C. advertising committee of which E. S. Jordan is chairman.

Discussing the problem of what proportion of local advertising is met by the distributor or dealer, the managers thought it should be a fifty-fifty proposition between factory and representative. Advertising in theater programs, catalogs and the like was the dealers' own proposition, it was thought, and it was also declared by some members present that the dealers, likewise, should stand the burden of direct-by-mail advertising.

Testing Consumer Media

"How Can the Consumer Media Be Tested?" was asked, and the general opinion was that it is almost impossible to test it, although its worth was realized. Cooperation was the answer to "How Can the N. A. C. C. and Factory Advertising Managers Be Mutually Helpful?" D. C. Hutchinson spoke in place of Frederick Dickinson on export advertising.

H. R. Hyman, advertising manager of of Stutz, handled "The Place of Special Appeal in Car Advertising." "Special appeals in car advertising have their value to be sure," Hyman said, "but special appeals do not serve to furnish sound foundation that permanence requires. They handicap rather than improve a business in the long run if they are indulged in at the sacrifice of a general appeal that establishes fundamental recognition and acceptance. However, again, the product itself must be taken into account, also the limitations imposed by its distribution."

The Tuesday session on trucks also was a lively session, the feature of which was a discussion of advertising of commercial passenger vehicles by Gordon Lee, the new export manager of the Yellow Cab Manufacturing Co. Lee believes in selling transportation as a means of selling the vehicles. In the case of the taxicab or bus he favors advertising to interest the people in other lines of business as to the money to be made out of operating buses or taxis. He says there is room for a taxicab service in every town of 5000 or over and cited Biloxi, Miss., with its 10,000 inhabitants and twelve taxicabs as an example.

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Few Makers Revise Prices at Chicago

Peerless, Maxwell, Pilot and Climber Changed—Lexington Lists "Skylark"

CHICAGO, Jan. 29.—As at New York, the price situation is proving one of the quiet notes of the show. Changes on the opening day were few and far between and the salesmen are not relying on reductions to interest their prospects. They talk quality, service, mechanical features—almost anything in fact but changes in lists.

Only four revisions were announced on the opening day of the show and of these two were increases and did not affect the entire line either. Peerless was one of the two to mark up a new card on two of its models, advancing the four-passenger suburban coupe from \$3,400 to \$3,550, and the two-passenger coupe from \$3,300 to \$3,400. Maxwell added \$40 to the price of its sport touring car, making the new price \$1,025 and added \$15 to the sport roadster, the new price being \$975. There were no changes in the lists of the closed models.

Pilot made substantial reductions in its entire line, the biggest cut coming on the sedan, which was lowered \$505. The new list now reads as follows:

	Old Price	New Price
Five-pass, phaeton.	\$2,000	\$1,695
Seven-pass. phaetor	1 2,050	1.745
Sport model	2,100	1,745
Coupe	2,950	2,445
Sedan		2,495
Seven-pass, sedan		2,645

Climber, which did not show at New York, but which made its appearance here, announced reductions of from \$2,250 to \$1,695 on its open models and of from \$2,750 to \$2,250 on the closed jobs. In addition it displayed a new sixcylinder roadster listed at \$1,095.

Lexington, bringing out its new "Skylark," a sport model, has set its price at \$1,795.

Locomobile Increases Prices of All Models

NEW YORK, Jan. 29—A price change that has been pending for several weeks was announced today by the Locomobile Co. of America. An advance of approximately \$2000 has been made on all models.

The revised list is as follows:

	(old Price	New Price
Phaeton		\$7,600	\$9,600
Four-passenger open.		7,600	9,500
Limousine		9,150	11,600
Coupe limousine		10,500	11,750
Cabriolet		10,700	12,200
Sedan		11,000	12,200
Chassis		6,800	8,600

FORD LOWER IN ENGLAND

DETROIT, Feb. 1—Ford Motor Co. has made a reduction in its British prices ranging from £15 to £24 a car.

The phaeton now lists at £128, compared with £152; coupe £215, compared with £230, and one-ton truck £170, compared with £185. Changes have been made in the design to meet the chief objections leveled against the Ford car in England, lower seating and right hand driving being provided.

Court Cuts Lincoln Tax to One-Third Original

(Continued from page 246)

for the company's dilemma upon the Government claim. Though there had been dissension among directors, this would have been overcome without the recourse to a receivership, he said at the time. The threatened claim, however, which in the beginning mounted to upwards of \$9,000,000, broke the courage of directors and the receivership was voted over the protests of the Lelands.

The final outcome of the suit finds Henry M. and Wilfred G. Leland outsiders in an industry in which they were long distinguished figures. For months following the Ford acquisition of the Lincoln property they continued as president and general manager respectively. Their resignations followed difficulty with the Fords. Henry M. Leland will be 80 years of age in February and, if his present plans do not miscarry, will have an important announcement to make about that time.

Time Allowed for Objections

DETROIT, Jan. 31—Final approval of the agreement between government attorneys and the receivers for the Lincoln Motor Car Co. will not be given by Judge Tuttle until Monday, so that any creditor may have the opportunity to file objection.

In the meanwhile the Detroit Trust Co. will prepare checks on the basis of 47.5 cents on the dollar for each creditor, these to be held until Monday pending the court's sanction.

Lincoln Under Ford Control

DETROIT, Jan. 31—The Lincoln Motor Car Co., concluding its first year of operation as a Ford Motor Co. division, reports a total output of 5242, an average of 473 monthly during the eleven months of Ford operation. In January, while the plant was under operation by the receiver, shipments were 39, thus increasing in February to 156 and reaching a peak of 733 in June.

COMET VALUED AT \$749,418

DECATUR, ILL., Jan. 27—Appraisers of the Comet Automobile Co. filed their report in circuit court today, but no order concerning the affairs of the company has been issued. The schedules show value of all property to be \$749,418, including \$367,783 real estate, factory and power house; \$12,200, office furniture and fixtures; \$1,339, factory furniture, and \$22,306, fixed tools and machinery.

Show Crowds Prove Big Motor Interest

Chicago Attendance Outnumbers New York Despite Bad Weather Conditions

CHICAGO, Feb. 1—Sam A. Miles, at the head of the show being held in the Coliseum and the Armory, feels elated over the way the public has supported him so far, in view of bad weather conditions. Since the doors opened on Saturday, the weather has been miserable.

"Despite the weather, we have been running ahead of New York so far in the matter of attendance," Miles says. "We are not equaling last year's Chicago mark, however, but last year was something exceptional in the way of attendance. This present show is normal and thoroughly indicative of the public's interest in such exhibitions."

The attendance of dealers is normal, and while there is not an exceptional number of retailers in attendance, yet the factory representatives find themselves extremely busy at all times.

In comparison with New York there

In comparison with New York there are not as many chief executives here from the factories, but the other executives more than make up for the absence of their chiefs.

Creditors of C. H. Wills Discuss Reorganization

DETROIT, Feb. 1—Creditors of C. H. Wills & Co., at a meeting here, informally discussed the tentative plan of reorganization. The company was placed in the hands of a receiver on Nov. 28, 1922. It is reported that there are immediate prospects of a strong reorganization being worked out.

The plan under consideration provides for the issuance of four classes of stock: common, first, second and third preferred.

The first preferred will be taken by bankers, who will put up \$2,500,000 new money for working capital; the second preferred will go to merchandise creditors and to the holders of \$1,500,000 revolving credit up to 75 per cent of their claims. The third preferred will go to the \$4,400,000 balance of revolving credit bankers and also to the 25 per cent of claims not covered by second preferred. New common stock will go to present stockholders.

ELECTION OF CORD TIRE

PITTSBURGH, Jan. 30—The Cord Tire Co. has re-elected its retiring directors and has placed on the directorate John J. Mitchell of the Illinois Trust & Savings Bank, Chicago, and James B. Lambie, Washington banker. The board has authorized the erection of additional buildings, which will give the company a capacity of 3000 tires daily, compared with 650 at present. The plant is located in Chester, W. Va.

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California Showing Gain in Truck Sales

Total of 1554 Made in December, 1922, Increase of 67 Per Cent Over 1921

OAKLAND, CAL., Jan. 30-Automobile sales for December throughout California showed the record month of the industry in this State, with the exception of November, 1922, which exceeded December by 402 sales, though December, 1922, sales were 99 per cent larger than those registered for the same month

According to "Motor Registration News" of this city, which has made a State-wide survey of the industry and its merchandising in December of las. year, passenger cars kept their lead in percentage of increase over that of the trucks. In December, 1921, the Motor Vehicle Department of California registered 7559 passenger cars, while in December, 1922, there were 15,409 registered, an increase of 7850 sales.

Though lower in percentage of increase than the passenger car sales, the motor truck business of the State shows a wonderful increase. In December last. 1554 trucks were sold in California, as compared with 928 in December, 1921, a gain of 626 sales, or 67 per cent. Taking these totals of both branches, sales for December, 1922, were 16,963 cars and trucks, or 8476 more than in the same month in 1921, an increase of approximately 99 per cent.

Franklin Makes Change in Merchandising Plans

CHICAGO, Feb. 1—About 200 Frank-line dealers assembled here yesterday for their annual meeting and dinner, at which General Manager S. E. Ackerman announced a change in merchandising plans. He stated that hereafter the cars would be produced in quantities sufficient to meet the requirements of dealers, and that in the merchandising of cars dealers would be asked at certain seasons to take particular types of cars and concentrate their selling efforts on those

In one month, for instance, the concentration would be no closed cars and in another month it might be on open cars. This, he said, would enable the factory to concentrate on certain types with an increase in efficiency and economy.

In connection with this announcement it was made known that hereafter the "group" method of manufacture will be used at the Franklin factory instead of the "lot" method.

Election of Officers

SYRACUSE, N. Y., Jan. 29-Officers and directors for the ensuing year were elected at the annual meeting of the H. H. Franklin Manufacturing Co. and the Franklin Automobile Co.

The following were elected directors

of the H. H. Franklin Manufacturing Co.: H. H. Franklin, John Wilkinson, F. A. Barton, G. H. Stilwell, A. T. Brown, E. H. Dann, H. L. Franklin and Ralph Murphy. The board of directors met later and elected the following officers: President, H. H. Franklin, vice-president, John Wilkinson; and secretary-treasurer, F. A. Barton.

At the meeting of the Franklin Automobile Co., directors were elected as follows: H. H. Franklin, John Wilkinson, F. A. Barton, G. H. Stilwell and E. H. Dann. The following officers were elected: President, H. H. Franklin, and secretary-treasurer, F. A. Barton.

Trouble in obtaining bodies is holding back the production schedule of the H. H. Franklin Manufacturing Co. Production now is at the rate of forty cars a day. The schedule calls for fifty cars. Beginning February it is expected the fifty car a day production will be reached.

Railroads Attack Truck Lines in Pennsylvania

PHILADELPHIA, Jan. 31—The beginning of what will be a test case in Pennsylvania to determine whether railroad companies will be enabled to put out of business, on the grounds of "illegal competition," motor truck lines hauling freight between points covered by their tracks and paralleling them for any distance, came this week, when the Public Service Commission issued against the American Freight Transportation Co., with headquarters in this city, an order to "cease and desist" doing business is a common carrier.

The order was issued when the Pennsylvania and the Philadelphia & Reading companies showed that the transportation company, which operates six trucks between Philadelphia and Bethlehem and Philadelphia and Allentown, had not taken out a certificate entitling it to act as a common carrier.

Attorneys for the transportation company say that a decision preventing the company from operating as a common carrier-that is, from obtaining its license to act as such-would have a decidedly detrimental effect throughout the State on sales of trucks.

FORD'S DRAWBACK ALLOWANCE

WASHINGTON, Jan. 29-Treasury regulations covering drawback allowances on automobiles and automobile parts made by the Ford Motor Co. at Detroit have been extended to include those manufactured at the Newark, N. J., plant of the company, applying on exports made on and after Oct. 21, 1922.

REPUBLIC SALE HITS SNAG

ALMA, MICH., Jan. 31-Application for authority to sell the assets of the Republic Truck Co., valued by appraisers at approximately \$6,000,000, has been referred by Federal Judge Tuttle to a master in chancery because of disagreement as to the priority of claims and as as to the scope of a trust mortgage on the truck company's property.

Will Raise Protest at Rubber Control

Association Appoints Committee at Annual Meeting to Fight **British Action**

CHICAGO, Jan. 31-A committee to formulate a protest against the British rubber restriction act to which the rapid and marked advance in the price of crude rubber is largely attributed was appointed vesterday by the Midwest Rubber Manufacturers Association in its annual meeting here. Thomas Follen, president of the Lion Tire & Rubber Corp., Lafayette, Ind., is chairman of the committee, and the other members are Sidney J. Roy of the Hannibal Tire & Rubber Co., Hannibal, Mo., and N. S. Brown, consulting engineer, Cleveland.

Election of officers resulted in the reelection of President W. W. Wuchter, head of the Nebraska Tire & Rubber Co., and of Thomas Follen as vice-president. The office of treasurer was left open, to be filled at the next monthly meeting which will be held March 13 in Cleveland.

Wuchter said the high cost of crude rubber and other materials entering into tires has created a perilous condition for the small tire makers, but that, by the practice of the greatest economy and efficiency in production and selling methods, and concentrating on quality of product, most of them are maintaining a fair position and hoping for better conditions.

The annual banquet of the association was held last night. There was a large attendance at the banquet and the business sessions.

Commission to Inspect **Detroit Motor Plants**

DETROIT, Jan. 31-The commission representing the British Rubber Growers Association, which came to this country to confer with the rubber association on the vitally important question of restricting the output of crude rubber, arrived here today to inspect some of the larger automotive plants.

Members of the commission frankly confess that they have been amazed at the vastness of the American automotive industry, and that they will take home with them a much different conception of its needs for tires and the rubber with which to make them.

The tire plants at Akron which they inspected were a revelation to them, and it is probable they will be even more astounded at the size of Detroit's automobile factories. The commission expects to remain in this country another week or ten days. It is working harmoniously with the representatives of the rubber association, whose only demand is that the price of rubber shall be stabilized and that there shall be a supply adequate to meet their needs.

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Big Financing Done by G. M. Acceptance

Accommodations Extended to Dealers Thus Far Reaches Total of \$337,600,000

NEW YORK, Jan. 30—In less than four years of operation, a report issued by the corporation shows, the General Motors Acceptance Corp. has financed, under its retail plan, sales of 274,775 cars, trucks and tractors, and, under its wholesale plan, 165,782 cars, trucks and tractors, exclusive of other General Motors products and export shipments financed.

The acceptance corporation confines its financing to the products of the General Motors Corp. by which it is owned and controlled. While it is difficult to determine the extent of the part played by time sales in the sales and distribution operations of the automobile manufacturer, the figures of the acceptance corporation give an idea of the importance of an institution of this character.

Up to Dec. 31, 1922, the report shows, financial accommodation of \$337,600,000 has been extended to dealers in General Motors products classified as follows:

	Retail	Wholesale	Foreign
Year	Plan	Plan	Department
1919	\$9,989,019	\$7,635,777	\$3,256,192
1920	46,693,170	37,578,470	19,830,994
1921	39,725,007	34,370,140	3.361,881
1922	73,583,845	53,982,910	7,593,509

Totals.\$169,991,041 \$133,567,297 \$34,042,576

Close to \$300,000,000 of the Acceptance Corporation paper has been discounted and paid at maturity, and as of Dec. 31 last it had outstanding obligations of approximately \$45,000,000. In order to accommodate the growing demands of the business, General Motors Corp. subscribed and paid in an additional \$1,000,000 of capital funds in December last.

Condensed Balance Sheet

The condensed balance sheet as of Dec. 31, 1922, indicates that the acceptance corporation has enhanced the strength of its position considerably in the past year. Total assets consisting practically entirely of cash and quick receivables are \$54,645,799. Capital, surplus and profits are \$6,309,256. Domestic obligations outstanding total \$43,517,619. Total reserves are \$872,958. Interest and charges received and held in deferred income accounts are \$1,117,984.

Weekes-Hoffman Debts Nearly Equal to Assets

SYRACUSE, Jan. 29.—Adon J. Hoffman of this city has been appointed receiver for the Weekes-Hoffman Co., Inc., at one time a large gear manufacturing concern. Voluntary dissolution proceedings have been instituted and Supreme Court Justice Ernest I. Edgcomb has granted an injunction restraining

creditors of the company from taking legal action while the affairs of the corporation are being settled.

In the petition the liabilities of the company are given as \$265,000 with assets, including its Dickerson Street plant and machinery, of \$230,000. During the war the plant made steel plugs and following the armistice developed straight bevel gears. It was handling work for Ford, Maxwell and Chevrolet cars. When Ford began gear production and the two other concerns changed to spiral bevel gears, the business of the company vanished.

The authorized capitalization of the company was \$750,000 and \$171,900 in preferred stock and \$218,400 in common was issued. The receiver was petitioned to prevent legal procedure which it is said would wipe out the assets. No reorganization scheme is being considered.

FINANCIAL NOTES

Studebaker Corp. directors have declared a quarterly dividend of 2½ per cent on the common stock, thus continuing the stock on a 10 per cent annual basis. As a result of the action of the directors toward the close of 1922 in declaring a 25 per cent stock dividend and increasing the number of shares outstanding from 600,000 to 750,000, the maintenance of the regular dividend at 10 per cent annually is equal to 12½ per cent on the smaller capitalization before the stock dividend. The directors have also declared the regular quarterly dividend of 1¾ per cent on the preferred stock, both dividends being payable March 1 to stockholders of record Feb. 10.

Fisher Body Corp. for the eight months ended Dec. 31, 1922, reports earnings applicable to interest, after depreciation and amortization of existing debt, but before United States and Canadian government taxes of \$8,532,160. Current assets on tentative balance sheet as of Dec. 31, 1922, giving effect to new financing, are \$43,675,252 and current liabilities \$8,024,329. Of the current assets \$8,883,000 is cash and \$10,951,000, notes and accounts receivable; current liabilities include \$6,422,906 accounts payable and accrued payrolls and interest, together with \$1,601,423 Federal taxes accrued.

Haynes Manufacturing Co. has declared a dividend of 1 per cent on its preferred stock, payable to stock of record Feb. 1. The directors have announced that dividends of 1 per cent payable each month will be continued on preferred until arrears are paid up, if present earnings continue.

Joseph N. Smith & Co. has been granted approval by the Michigan Securities Commission to issue \$199,970 in common stock, and its entire issue of \$500,000 has been validated.

Roamer Motor Car Co. has been granted approval by the Michigan Securities Commission to issue \$125,000 in preferred stock and 62,500 shares of no par stock at \$2 a share.

International Harvester Co. has declared the regular quarterly dividend of \$1.75 a share on preferred stock, payable March 1 to stock of record Feb. 10.

Wright Aeronautical Corp. has declared the regular quarterly dividend of 25 cents, payable Feb. 28 to stock of record Feb. 24.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

Last week the tendency in the call money market was slightly firmer, quotations ranging between 4 per cent and 5 per cent, as compared with $3\frac{1}{2}$ per cent and 4 per cent in the preceding week. In time money the situation remained unchanged, and the volume of business transacted was light. Quotations ranged from $4\frac{1}{2}$ per cent to $4\frac{3}{4}$ per cent for all periods from 60 days to 6 months, as in the preceding week. The prime commercial rate is still quoted at $4\frac{1}{2}$ per cent to $4\frac{3}{4}$ per cent.

Revenue freight loadings for the week ending Jan. 13 totaled 873,251, which is a new high record for this season of the year, and marks an increase of 102,948 cars over loadings for the preceding week, and an increase of 159,060 over those for the corresponding week of 1922.

The net earnings of the United States Steel Corp. for the last quarter of 1922 amounted to \$27,552,392, as compared with \$27,468,339 for the quarter ending with September, and \$19,612,033 for the last quarter of 1921. The company failed to earn the quarterly dividend on the common stock by \$1,375,356, as compared with a deficit of \$1,339,002 in previous quarter and \$5,280,901 in the last quarter of 1921. For the entire year of 1922 net earnings aggregated \$101,647,661, as compared with \$92,726,058 in 1921. After the payment of all dividends, a deficit of \$10,926,771 was reported for 1922 against \$14,017,785 in 1921.

Two of the largest independent steel companies of the country came into the market last week with new financing to the amount of \$35,000,000. The Bethlehem Steel Corp. sold \$25,000,000 of Series B Consolidated Mortgage 30-year 5½ per cent Gold Bonds, and the Republic Iron & Steel Co.'s issue of 30-year 5½ per cent Refunding and General Mortgage Gold Bonds accounted for the other \$10,000,000.

The Federal Reserve statement as of Jan. 24. 1923, showed an increase of \$2.645,000 in gold reserves and \$7,844,000 of total reserves.

Bill Threatens to Stop Indianapolis Race Meet

CHICAGO, Jan. 31—It developed here today that there is great danger of the Indianapolis speedway race, the motoring world's greatest classic, being abandoned because of the proposed action of the Indiana Legislature which is considering a bill to prohibit the promotion of any event on Memorial Day where cash prizes are offered.

This is said to be aimed at the Indianapolis race. The bill has already passed the Senate, and visitors from Indianapolis, here for the show, say that an unofficial poll of the House shows 70 per cent of the members favor its passage.

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Another Plant Taken in Big Wheel Merger

Sale of Forsyth to Motor Wheel Follows Latter's Purchase of Disteel

CHICAGO, Jan. 29—Motor Wheel Corp. announces the purchase of Forsyth Bros. Co. of Harvard, Ill., manufacturer of Forsyth wheels, thus completing a merger of steel wheel manufacturers involving an invested capital of more than \$10,000,000 and eight plants with a maximum output of 16,000 wood wheels and 8000 steel wheels daily. The Disteel division of the Detroit Pressed Steel Co., the third company in the merger, was taken over by the Motor Wheel Corp. last week.

Enlarged manufacturing programs will be entered into at all three manufacturing units, at Lansing, Detroit, and Harvey. At the main plant of the company at Lansing, the facilities for manufacturing Tuarc wheels have recently been doubled, increasing the capacity to almost 4000 steel wheels daily.

Similar plans are in prospect for the Forsyth plant, special importance being attached to this unit because of its location and because its equipment is such that it can be expanded into a second, independent source of Tuarc and Disteel as well as Forsyth wheels.

The direction of the enlarged motor wheel organization will remain in the hands of the present executives, with H. F. Harper as president; A. C. Carlton, vice-president; and J. B. Siegfried, general sales manager. No change in the personnel of the Disteel and Forsyth units is contemplated.

Frame Manufacturers May Merge Interests

NEW YORK, Feb. 1—Negotiations are reported to be under way for the merging of three corporations engaged chiefly in the manufacture of automobile frames, with the object of economy of operation.

It is stated that the combined assets of the companies, according to their latest balance sheets, approximate \$40,000,000. While frames constitute the major part of their output, the companies also manufacture other products used in the motor car industry.

Aeronautical Chamber Now Has 198 Members

NEW YORK, Jan. 30—A 100 per cent growth in membership during the first year of its existence is recorded in the annual report of the Aeronautical Chamber of Commerce of America, Inc., submitted at the quarterly meeting of the board of governors.

Total membership now numbers 198, which embraces 20 manufacturers, of complete units of aircraft, engineers or

large operators in class A, 50 engineering firms or manufacturers, or purveyors of motors, parts, accessories and supplies in class B, and 128 individual or small operators in class C. The membership is distributed throughout the United States and three foreign countries.

At the quarterly meeting Allan Jackson, vice-president of the Standard Oil Co. of Indiana, was elected to fill the vacancy in the board. I. M. Uppercu of Aeromarine; F. H. Russell, Curtiss; J. R. Cautley, Wright Aeronautical; W. E. Young, Goodyear; and S. S. Bradley, the general manager, were appointed to serve on the flying meet and show committee.

C. F. Redden, Aeromarine, and F. H. Russell were designated as representatives of the chamber on the sectional committee considering an air safety code under the sponsorship of the Bureau of Standards and the Society of Automotive Engineers.

INDUSTRIAL NOTES

Morgan Manufacturing Co. is installing new automatic machines in its plant, which has been enlarged at an outlay of \$40,000, for the manufacture of automobile accessories. It is planned to produce its new timer at the rate of 5,000 a week, and increase the output of spark plugs. The force of road salesmen is now said to comprise 21. B. R. McKenney is sales manager and R. M. Paddock, formerly of the Dorman Oil Co., has come to the concern as assistant sales manager. R. Robert Riskin, vice-president, regards the outlook for the coming season as excellent.

Chester Auto Parts & Machine Co., manufacturer of axle shafts for replacement, has broken ground for a modern factory at Crumm, Lynne Station, Chester District, Pa. The new equipment will double the company's present production facilities.

Diamond Steel Products Co., a new Minnesota corporation, has bought the industrial plant of the Allied Tractor Co., Minneapolis, and will construct a \$100,000 factory to make wrist pine etc.

Oilgear Co., Milwaukee, has opened an office in Detroit at 415 East Jefferson Avenue. Donald Clute, who formerly handled the sale of Oilgear products for the Cadillac Machinery Co., has been placed in charge.

Engineers Perfect Plan for Meeting Service Men

NEW YORK, Jan. 27—Arrangements have been perfected for what is said to be the first joint meeting of automotive engineers and service men of the industry, Thursday evening, Feb. 8, at the Automobile Club of America. The meeting will be held under the auspices of the metropolitan section of the Society of Automotive Engineers and Automotive Service Association.

A subject proposed by the service men, "Does Factory Engineering Work and Practice Give Full Consideration to Service Station Problems?" will be discussed

METAL MARKETS

As a prelude to the generally expected rise of the sheet market, the supply is becoming tighter and tighter. Most of the sheet rollers are booked to capacity up to April 1, and have turned down business for delivery maturities beyond that date. Youngstown reports state that some of the non-integrated sheet rollers have been compelled to slow down operations because of their inability to obtain sheet bars at prices consistent with those carried by the sheet orders to the filling of which they are to be applied.

Pending a readjustment of the sheet market the sheet bar quotation of \$38.50 has become strictly nominal as there are no sellers at that price level. If the \$3 per ton advance in sheet prices materializes, the sheet bar situation will right itself speedily, as the price of sheets invariably makes the price for sheet bars. There is no scarcity of semifinished steel, but there is a scarcity of both semi-finished and finished steel at prices in vogue a month or two ago. The leading steel producing interest is apparently convinced that a modest upward readjustment of prices will not disturb the market's equilibrium and while proceeding very slowly in revising upward the selling prices of its own subsidiaries, it is not bringing any pressure to bear on independents with a view to discouraging reasonable advances.

What few additional orders for full-finished automobile sheets have been booked in the last few days carried a 5 cents base price. Quite a fair tonnage is now on rollers' backlog at around that price level in spite of the \$6 per ton disparity between that figure and the nominal 4.70 cents quotation of the chief interest. What the price for full-finished automobile sheets will be if the \$3 per ton advance in ordinary sheets ensues, is problematical. Rollers of full-finished automobile sheets are talking of much higher prices, but it would seem that the market for this specialty has to some extent at least discounted in advance the anticipated rise in sheets.

Pig Iron.—Most of the buying by automotive foundries is in small lots for nearby delivery. Some consumers are sounding the market with reference to covering their second quarter requirements, but blast furnace interests profess unwillingness to sell far ahead because of the uncertainty of fuel and labor costs.

Aluminum.-A local publication printed a few days ago a statement that a large Japanese house had received from its home office a cable to the effect that "the aluminum manufacturers of the world are in the course of forming a syndicate with head-quarters in New York." In all probability this rumor has no basis in fact save that it is predicated upon the impression which is gaining ground in all aluminum markets that the days of cut-throat competition between producers have come to an end and that an international understanding, such as is known to have existed in before-the-war years is likely to be arrived at between the world's aluminum producers. Certain it is that the domestic producer is once more the dominant market factor. Sheets bring a premium in the outside market over the prices quoted by the American producer because the latter is far behind in deliveries. Foreign ingots are held at the domestic producer's prices.

Copper—The market has not only fully recovered from the set back it suffered early in the month but has moved up another peg to the 15 cent level.

Calendar

FOREIGN SHOWS

- March 31 April 29 Madrid, Spain, International Auto-mobile Exposition at the Palacio de Exposiciones, Palacio de Exposiciones, showing automobiles, mo-torcycles, accessories and equipment, under the auspices of the Chambre Syndicale de l'Automobile et du Cycle.
- May 9 June 12 Gothenburg,
 Sweden, International
 Automobile Exhibition,
 Sponsored by the Royal
 Automobile Club of
 Sweden.
- 4-10-- Paris, Passenger Cars, Bicycles, Motor-cycles and Accessories, Grand Palais.
- Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

RACES

10 — Berlin - Grunewald, German Grand Prix.

2 — Tours, French Grand Prix 500-mi. race.

CONVENTIONS

- Feb. 8-9—Chicago, City Club, Winter Sectional Meeting of the American Society for Steel Treating: W. H. Elsenman, 4600 Prospect Avenue, Cleveland, national secretary.
- Feb. 15 16 Chicago, National Association of Taxicab Owners, Hotel Sherman.
- 17—New York, American Engineering Standards Committee in the board Committee in the board room of the American So-ciety of Mechanical Engirs. to discuss a safety
- 2, 3, 4—New Orleans, Annual Convention of the National Foreign Trade Council.
- -New York, Annual Convention of the United States Chamber of Commerce. May-New

S. A. E. MEETINGS Metropolitan Section

- 8—Relation of the Service Station to the Factory and Engineering Department— J. W. Lord and B. B. B. a.c. h man. Automobile J. W. Lord Bachman. Club of A America,
- h 15—Speaker, William P. Kennedy, President, Ken-nedy Engineering Corp.; Subject, Trolley Buses and Flexible Vehicles for Street Railway Service. March 15-
- April 19-Speaker, Edw. E speaker, Edw. E. La Schum, General Superin-tendent, Motor Vehicle Equipment, American Railway Express Co.; Sub-ject, Engineering Features of Fleet Operation.
- May 17—Speaker, F. P. Gilligan, Secretary, Henry Souther Engineering Co., Subject, Metallic Materials for Automotive Work.

Other Meetings

- Other Meetings
 7 Minneapolis Section—
 Transportation on the Upper Mississippi River via Barge, Motor Tow-Boat, and Terminal Delivery by Truck—J. S. Brodie, Builders Exchange, 8 P. M.
 8—Indiana Section—Practical Application of Lubrication—William F. Parish, Athenaeum, Michigan and New Jersey Streets, Indianapolis.
 15—New England Section—A High Speed Engine with Feb.
- Feb 15. A High Speed Engine with Unconventional Valve Gear—Rollin Abell. Buckminster, Bos Boston,
- P. M. 20—Dayton Section—Alloy Steel Valves and the Effect of Heat on Various Steel Alloys — Robert Jardine. Dayton Engineers Club, 8
- Feb. 21—Pennsylvania Section— Lubrication Robert E. Wilson. Engineers Club, Philadelphia, 8 P. M.

Declared Valuation Stands, Says Court

NEW YORK, Jan. 27.-In a decision recently rendered, the Supreme Court of the United States declares that having accepted the benefit of the lower rate dependent upon the specified valuation, it would violate the plainest principles of fair dealing to allow a shipper, in event of loss, to claim a higher value. A bulletin issued by the National Automobile Chamber of Commerce to its members outlines the cases and ruling of the court.

The case involved two trunks and a package, the express receipt reciting that its terms and conditions were agreed to by the shipper and that the company's liability would not exceed 50 cents per pound unless the true value was declared and paid for under the excess valuation schedule.

The shipper sued for \$1,500 on the ground that the act known as the Cummins Amendment makes every common carrier liable for the full, actual loss, damage or injury to property notwithstanding any limitation of liability of the amount of recovery or representation or agreement as to value.

There is a proviso, however, regarding rates dependent upon the value declared in writing by the shipper or agreed upon in writing as the released value of the property; neither the receipt nor any agreement was signed by the shipper and trial court gave judgment for \$916.15.

The higher court rules that the shipper, by receiving and acting upon the receipt assented to its terms and it became the written agreement of the parties.

MAY BUY PERFECTION TIRE

FORT MADISON, IOWA, Jan. 27-J. B. Gabeline, Burlington, Iowa, president of the Standard Four Tire Co. of Keokuk, and a dozen officials of that organization spent the day investigating

and inspecting the plant of the Perfection Tire & Rubber Co., bankrupt, which will probably be sold within the month at a referee's sale.

Gabeline said the Keokuk plant is operating at capacity and that with proper management the Perfection plant could be utilized, too. He did not state whether it is the intention of the Standard Four to operate the Perfection plant as a Standard Four production center or independently.

Ralph E. Espy Acquires **Burton-Norton Interest**

CHICAGO, Jan. 31-Ralph E. Espy has purchased the interests of H. W. Norton of the Burgess-Norton Manufacturing Co. of Geneva, Ill., manufacturer of piston pins. At the annual meeting of the board of directors C. M. Burgess was elected president and treasurer of the company; Espy, secretary, and F. E. Burgess, assistant secretary. C. M. Burgess will supervise the management of the plant and finances, while Espy will be in charge of sales and F. E. Burgess in charge of purchasing.

Espy was formerly identified with the U. S. Manufacturing Corp. of Decatur, Ill., as general manager, and previously was identified for a number of years with Butler Bros., Chicago, as a department executive.

A complete reorganization and systematizing of the production department has been effected.

STEVENS-DURYEA GAINING

SPRINGFIELD, MASS., Jan. 30-Harry G. Fisk, who as one of the receivers is exercising control of production at the Stevens-Duryea plant in Chicopee Falls, reports that the output of cars from the factory is now four to five a week, an increase over the operations of summer and fall.

He expects that this will be further increased, and possibly be brought to ten or fifteen weekly by early summer.

Attack on Goodyear's **Contract Opened**

AKRON, OHIO, Jan. 30,-New methods of attack upon the \$85,000,000 refinancing and reorganization program of the Goodyear Tire & Rubber Co. have been taken by stockholders in their litigation started in the Akron courts last August. Mrs. Laura T. Weiss, Goodyear scockholder of Cleveland, in whose name the first four suits were filed against Goodyear and the financial syndicates negotiating the Goodyear re-financing, has filed amended petitions which will come before the court, together with the original petitions, for final hearing and adjudication which has been set for Feb. 26.

Shortly after Mrs. Weiss filed her action attacking the legality of the contract entered into by Goodyear with the Leonard Kennedy Co. of New York, which provided for payment by Goodyear of \$250,000 annually plus 5 per cent of profits over \$10,000,000 for the services of the president and treasurer of Goodyear; the Goodyear directors abrogated the contract and wrote a new one.

Seeks Invalidation

Mrs. Weiss now attacks the new Kennedy contract and asks the court to invalidate it. She also charges violation of Ohio laws in the system of redeeming first mortgage gold bonds. Goodyear redeems \$750,000 worth of this \$30,000,000 issue every six months. The bonds redeemed and retired are those whose serial numbers are drawn by means of a lottery.

The court hearing to open Feb. 26 will center on a motion filed by Mrs. Weiss to enjoin the trustees of 10,000 shares of management stock from voting that stock at the annual Goodyear stockhold-The action ers meeting in March. charges this stock is illegal and exercises a secret domination of Goodyear affairs, being able to outvote all other Goodyear stock.